NATIONAL ACTION PLAN FOR PREVENTION AND CONTROL OF NON-COMMUNICABLE DISEASES AND HEALTH PROMOTION IN PAKISTAN

World Health Organization
Ministry of Health
Government of Pakistan
Heartfile
A Public-Private Partnership in Health

National Action Plan for Prevention and Control of Non-Communicable Diseases and Health Promotion in Pakistan

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The cover design, in addition to highlighting the public-private partnership dimension of this work, depicts an eccentrically placed watermark symbolizing movement as manifested by the circular brush strokes. This logo delineates the circle of health surrounding the human body.

National Action Plan for Prevention and Control of Non-Communicable Diseases and Health Promotion in Pakistan

With accompanying CD-ROM

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Précis

NCDs are being addressed within a combined strategic framework

By convention, the term 'non-communicable' diseases (NCDs) refers to major chronic diseases inclusive of cardiovascular diseases, diabetes, cancer and chronic respiratory diseases and their risk factors. As part of this initiative, however, the chronic conditions of mental illnesses and injuries have also been grouped alongside as country requirements necessitated that these be addressed through synchronized public health measures within a combined strategic framework.

Collectively, these conditions accounted for an estimated 33.4 million deaths worldwide in the year 2002; of these, 72% occurred in the developing countries.[1] NCDs and injuries are amongst the top ten causes of mortality and morbidity in Pakistan;[2] estimates indicate that they account for approximately 25% of the total deaths within the country.[3] NCDs contribute significantly to adult mortality and morbidity and impose a heavy economic burden on individuals, societies and health systems.[4] In most cases, it is the economically productive workforce, which bears the brunt of these diseases. Existing population-based morbidity data on NCDs in Pakistan show that one in three adults over the age of 45 years suffers from high blood pressure.[5] The prevalence of diabetes is reported at 10% whereas 40% men and 12.5% women use tobacco in one form or the other.[6,7] Karachi reports one of the highest incidences of breast cancer for any Asian population.[8] In addition, estimates indicate that there are one million severely mentally ill and over 10 million individuals with neurotic mental illnesses within the country.[9] Furthermore, 1.4 million road traffic crashes were reported in the country in the year 1999. Of these, 7000 resulted in fatalities.[10] Against this backdrop, the present exercise is the first opportunity to develop and implement a National Plan of Action aimed at preventing and controlling these diseases.

Addressing NCDs in a developing country such as Pakistan is a multidimensional challenge with implications at different levels. Lobbying for appropriate investments and policies to facilitate the inclusion of the prevention of NCDs as part of the global development and health agenda is a critical aspect of the issue.[11] However, on the other hand, the implementation of policies for the prevention of NCDs is a challenge in its own right because of the diverse nature of strategies that need to be instituted in tandem. These include institutional, community and public policy level changes set within a long-term and life-course perspective.

These considerations lent impetus to the formulation of a tripartite alliance between the Ministry of Health, Government of Pakistan, the World Health Organization, Pakistan office, and the NGO Heartfile.[12] This public-private partnership aims at the development and implementation of a long-term national strategy for prevention and risk factor control of NCDs and health promotion in Pakistan.

The approach adopted contributes to strengthening of the public health configuration

The National Action Plan for Prevention and Control of Non-Communicable Diseases and Health Promotion in Pakistan (Action Plan) has been developed with inputs generated through an extensive process within the different domains of NCDs and is reflective of broad-based consensus.[13]

This initiative attempts to incorporate core public health principles into country health programme planning through an approach that seeks evidence before planning interventions and utilizes intervention-monitoring to generate further evidence. It has a comprehensive configuration with evidence-based policy and action-oriented dimensions calling for a change at the institutional, community and public policy levels. The strategy has been designed to overcome the tendency to rely on a disjointed set of small scale projects, factoring integration at four levels: grouping NCDs so that these can be targeted through a set of actions, harmonizing actions, integrating actions with existing public health systems and incorporating contemporary evidence-based concepts into this approach.

The Action Plan delivers an **Integrated Framework for Action** (**IFA**). The **IFA** has been developed as a concerted approach to addressing the multidisciplinary range of issues within a prevention, control and health promotion framework across the broad range of NCDs. It is modelled to impact a set of indicators through the combination of a range of actions in tandem with rigorous formative research. The **IFA** emanates from the concept highlighted in Fig. 1 (Page 17). The *at-risk* population represented in the pyramid can be targeted by dovetailing high-risk and population approaches. These need to be evidence-based and set within a supportive policy and regulatory environment. The **IFA** encompasses two sets of strategies within this framework – those which are *common* to NCDs and have, therefore, been combined and others which are *specific* to NCDs. Behavioural change communication, reorientation of health services and monitoring and surveillance fall in the first set of strategies while the second covers legislative and regulatory matters. The approach adopted as part of the Action Plan obviates the need for vertical interventions that have the potential to fragment the healthcare system. Instead, it horizontally integrates the prevention and control of NCDs with the existing primary healthcare and social welfare infrastructure, thus contributing to strengthening of the pubic health configuration; it also influences primary healthcare towards a more preventive orientation by establishing interdisciplinary primary care teams.

The Action Plan packages several contemporary as well as novel approaches. The population approach includes a behavioural research and social marketing-guided communication strategy and an active role for local opinion leaders and educational institutions. The Action Plan attempts to horizontally reorient health services to a more preventative orientation around NCDs through the scaling up of professional capacity and basic infrastructure and by ensuring availability and access to certain drugs at all levels of healthcare. In addition, the **IFA** includes a common population surveillance mechanism for all NCDs (with the exception of cancer). The model includes population surveillance of main risk factors that predict many NCDs and combines a module on population surveillance of injuries, mental illnesses and stroke. It also combines knowledge and practice-related modules and

programme-specific components. This enables tracking of implementation processes using appropriate indicators, facilitating an assessment of how interventions work and which components contribute most to success.

The Action Plan maximizes on the strengths of partnerships and outlines a scope of interventions that are built on shared responsibility, allowing agencies to participate according to their own missions and mandates. If implemented in its true spirit, the Action Plan has the potential to improve outcomes across the range of NCDs in Pakistan.

This initiative is one of the few initial partnership-based, concerted national responses to the global challenge of NCDs from within the developing countries. The active role of WHO as an international public health agency with the global mandate of promoting best practices through its linkages with governments in respective countries, broadens the scope of this initiative. Lessons learnt from this experience may prove useful for designing analogous strategies in similar settings.

Though the ingredients of this strategy are sound, it needs to be supported by a clear, strong and sustained political and policy commitment backed by a legislative framework that is supportive of multi-stakeholder models. Implementation of the Action Plan will lead to generation of new information relevant for improving the performance of the health system by fostering public-private partnerships within evidence-based models. It will also provide the empirical basis for health sector reforms in the area of pubic-private collaboration. The experience will not only permit an analysis of health system models built on shared responsibility for achieving sustainable health outcomes but will also provide an understanding of how to plan, manage and finance such activities in the future.

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Prelude and Finale

High-cost curative care is inaccessible to the vast majority of Pakistan's population

Disease prevention and health promotion are the most effective interventions for solving Pakistan's healthcare crises. Based on this premise, it is pertinent that this approach be applied to the domain of NCDs. Such sector investments are valid in view of evidence that highlights the existing potential to prevent these diseases and upholds the principles of equity in health, in view of the understanding that technology-intensive, high-cost curative care is inaccessible to the vast majority of the country's under-privileged population.

The global health challenge posed by the escalating burden of NCDs in the developing countries has been well documented in various reports and publications.[14] An estimated 33.4 million deaths were caused by NCDs and injuries in the year 2002. Of these, 72% occurred in the developing countries.[1] The situation as it relates to individual NCDs in Pakistan has been highlighted within the respective disease domains in the following sections. NCDs have grave economic implications as they incur huge costs in care and lost productivity. It is, therefore, fortunate that they are preventable to a large extent. Against this backdrop, lessons learnt from the experiences of developed countries draw attention to a public health opportunity involving population-level interventions to mitigate risks and to reduce the incidence of these diseases.[15] Whilst a preventive population-based approach is known to be the most cost-effective, paradoxically most developing countries have adopted a high-technology approach to the management of NCDs. It is, therefore, important to promote a shift away from individuals at the extreme ends and towards population-wide risk levels.

Addressing NCDs in the developing countries is a multidimensional challenge with implications at different levels. Lobbying for appropriate investments and policies to facilitate the inclusion of prevention of NCDs as part of the global development and health agenda is a critical aspect of the issue. This calls for stepping up advocacy efforts to target governments and donor, development and health agencies. However, on the other hand, implementation of such policies in the setting of developing countries is a challenge in its own right because of the diverse and multidisciplinary nature of strategies that need to be instituted to address this issue. Models established in the developed countries offer limited guidance owing to resource and infrastructure incompatibilities.

The Action Plan is a locally suited, concerted and integrated approach - one that incorporates both policies and actions. Accomplished through a novel public-private partnership arrangement, the formulation of the Action Plan was a truly national and broad-based exercise involving a wide range of

The Action Plan provides the empirical basis for health sector reform in the area of public-private collaboration

stakeholders. This initiative expresses the government's commitment to accord priority to the health challenges posed by NCDs.

The Action Plan has been modelled on an integrated approach to the prevention and control of NCDs and health promotion. It delivers an **Integrated Framework for Action** (**IFA**), which narrows down the broad agenda for the prevention of NCDs, focusing on a set of indicators that need to be impacted through processes set in tandem.

1.1 Strengths of the Action Plan

Several elements of this initiative can be regarded as an innovation in the pubic health approach to NCDs. These dimensions are discussed hereunder.

1.1.1 The public-private partnership dimension

The multidisciplinary nature of the approach to the prevention and control of NCDs warrants changes at the levels of the individual, the community, the health system and the health policy maker. This diverse playing field is an ideal setting to approach through a private-public-international health agency partnership arrangement. Such partnerships can create a powerful mechanism for addressing difficult problems by leveraging the ideas, resources and expertise of different partners. Venturing into this public health arena is guided by the premise that partnerships work better in evidence-based models.

These considerations lent impetus to the formulation of a tripartite partnership between the Ministry of Health, WHO and Heartfile to address this emerging health challenge in Pakistan's setting. The terms of this partnership, stipulated in an official agreement,[12] placed the onus of responsibility on Heartfile to provide national leadership in order to ensure meaningful deliberations for the development of the *National Action Plan for Prevention and Control of Non-Communicable Diseases and Health Promotion in Pakistan.* The Action Plan has been developed with inputs generated through an extensive process that encompassed a series of deliberations held with a range of stakeholders within the different domains of NCDs.

The Action Plan maximizes on the strengths of partnerships and outlines a scope of interventions that are built on shared responsibility, allowing agencies to participate according to their own missions and mandates. This partnership is in harmony with national health priorities, complements state initiatives and is optimally integrated with national health systems.

Implementation of the Action Plan will help generate new information relevant for improving the performance of the health system by fostering public-private partnerships within evidence-based models. It will also provide the empirical basis for health sector reform in the area of public-private collaboration. The experience will not only permit an analysis of health system models built on shared responsibility for achieving sustainable health outcomes but will also provide an insight on how to plan, manage and finance such activities in the future.

1.1.2 Integrated approach to NCDs

The approach embodied in the Action Plan is grounded in the principle that decisions people make about healthy choices are shaped by the physical, social, economic and legal environment. It, therefore, has a comprehensive configuration with evidence-based policy and action-oriented dimensions calling for a change at the institutional, community and public policy levels. It has been designed to overcome the tendency to rely on a disjointed set of small scale projects, factoring integration at four levels – grouping NCDs so that these can be targeted through a set of actions, harmonizing actions, integrating actions with existing public health systems and incorporating contemporary evidence-based concepts into this approach.

1.1.2.a Disease domain integration: the term NCDs is technically reserved for a group of preventable diseases that are linked by common risk factors. Cardiovascular diseases, some chronic lung conditions, cancer and diabetes fall within this category. However, the rare opportunity of tabling NCDs in country programme planning has been capitalized to include injuries and mental illnesses within this framework. The Action Plan illustrates that there are many common grounds for combining public health actions to address these diseases.

1.1.2.b Action level integration: the paradigm of NCD prevention referred to above is multidisciplinary in nature; it calls for a diverse range of actions involving policy development, legislation, regulation, public and professional education, guideline development, media interventions and research. Monitoring and evaluation need to be woven into this framework, making it necessary to institute a combination of measures and interventions at multiple levels in tandem with effective and rigorous formative research. Extrapolating this paradigm to the broad definitions of NCDs may, however, give the impression that the mandate is broad – in fact, too widespread. It is to address this specific concern that the **IFA** model has been developed.

The Integrated Framework for Action is based on the assumption that the objective of this diverse set of activities is to impact specific parameters or indicators. It is, therefore, modelled to poise these range of activities in a manner that they contribute to specific stipulated objectives. These objectives are reflected as indicators; this enables an assessment of progress made, both in impacting these indicators and in achieving the desired objectives.

The Action Plan contributes to strengthening of the pubic health configuration

The Integrated Framework for Action is modelled to impact a set of indicators through the combination of a range of actions in tandem with rigorous formative research. The **IFA** has its origin in the concept highlighted in Fig. 1 (Page 17). It targets the *at-risk* population by adopting the high-risk and population approaches set within an enabling policy and regulatory environment. It encompasses two sets of strategies – those that are *common* across the entire range of NCDs and others that are *specific* to each NCD domain. The first strategy maximizes on behavioural change communication, reorientation of health services and monitoring and surveillance, while the second pertains to legislative and regulatory matters.

1.1.2.c Systems level integration: the approach adopted as part of the Action Plan horizontally integrates the NCD prevention agenda with existing

Injuries and mental health have been included in the framework of NCDs

public health, primary healthcare and social welfare infrastructure. Integration of the prevention of NCDs with the National Programme for Family Planning and Primary Health Care and the WHO's Basic Development Needs Programme (BDN) are examples of this approach.

This approach is also valid in the context of the limitations that Pakistan's burdened health agenda faces in accommodating vertical programmes; such programmes are heavy on resources, take time to institute and often have the risk of fragmenting the healthcare system. Integration, on the other hand, will build on the strengths of the existing health system. This will help to strengthen the pubic health configuration and will influence primary healthcare systems towards a more preventive orientation.

1.1.2.d Integration of concepts: the Action Plan introduces several contemporary and novel approaches in public health. These include a behavioural research and social marketing-guided communication strategy, an active role for local opinion leaders and educational institutions, reorientation of health services to a more preventative orientation and a common population surveillance mechanism for all NCDs (with the exception of cancer).

1.1.3 An evidence-based approach

This effort is an example of the incorporation of core public health principles into country health programme planning through an approach that seeks evidence before planning interventions and utilizes intervention monitoring to generate further evidence. This approach bases decisions relating to programme resource allocations on an assessment of objective data including burden of disease, its potential for preventability and impressions relating to cost-effectiveness of proposed interventions. The Action Plan is focused on achieving a set of goals and objectives. It also allows an assessment of progress made in this direction by outlining a set of process, output and outcome indicators. In addition, their means of verification have also been laid out. Each item on the **IFA** is designed to contribute to a measurable outcome; programmes are meant to be evaluated periodically to assess the magnitude of progress towards achieving the desired outcomes. The objective of using the results of this evaluation is to improve and strengthen the programme and to refine its goals and objectives as appropriate. The Action Plan attempts to drive individual, group and organizational efforts, both in the public and private sectors, towards a common goal and objectives in order to impact a set of indicators that are known to bring tangible benefits in impacting NCD trends.

1.1.4 Maximizing on the strengths of partnerships

The public-private partnership dimension that lent impetus to the development of this Action Plan has already been referred to. This initiative also created a mechanism for visible involvement and participation of relevant ministries, educational institutions, NGOs and leadership foci at a national consultation level and created avenues for their participation in the process that led to the development of this Action Plan.

In addition, all the key elements and advantages that stand to be gained from comprehensive grouping and maximizing on partnerships have been built

upon in this Action Plan: *integration* with the existing health system, inter-sectoral and intra-health-sector *collaborations*, *linkages* with national health policies and *partnerships* with the private sector. The Action Plan recognizes the scope of partnerships in public health activities and outlines a scope of interventions that are built on shared responsibility, allowing for agencies to participate according to their own missions, mandates, interests and resources. The Action Plan fosters partnerships and interface arrangements between the public and private sectors so that the federal government is not solely responsible for getting these programmes out to the communities, but can rely on groups and national organizations that have complementary mandates.

The programme also fosters collaboration both within and outside of the health sector and calls for inter-sectoral action. Depending on the specific domain of NCDs, a range of preventive efforts need to be initiated as part of the **IFA**, with active involvement of and in partnership with the ministries of Health, Planning, Agriculture, Education, Finance, Housing, Communication, Environment, and Labour, both at the federal and provincial levels. For this purpose, inter-sectoral collaborating committees need to be established at the federal, provincial and district levels. Furthermore, the Action Plan also outlines a course of action for fostering partnerships with international agencies.

Future efforts as part of this Action Plan must also be focused on building a coalition or network of organizations at the national, provincial and local levels, facilitated by federal and provincial health services to add momentum to the prevention and control NCDs as part of a comprehensive prevention effort.

1.1.5 Linkage with the national health policy

A careful review of Pakistan's current health policy shows that this Action Plan is set within the existing policy framework.[16] It focuses on the prevention and control of diseases that are both *hazardous* and *largely preventable*. However, ideally, a national strategy on NCDs should be set within a more explicit policy framework – one that links relevant ministries in a manner that is mutually supportive of national NCD goals. In the present context, the ministries of Health, Planning, Agriculture, Education, Finance, Housing, Communication, Environment, and Labour should designate reasonably high-level focal points to ensure ongoing consultation and collaboration. Support for this should come from the highest ministerial level in each instance and should ideally reflect support of the Cabinet as well. In other words, the urgent challenge of controlling NCDs must be recognized at the highest political level. Given the long latency involved and the long natural histories of chronic diseases, a successful outcome at the population level can only be achieved as a long-range objective. Ensuring continuation of policies on a long-term basis is, therefore, a key challenge. The recent establishment of a National Health Policy Unit at the federal level in Pakistan should serve this purpose.

While it is vital to enlist support for a policy framework from the top, it is equally critical to garner the participation and support of all relevant sectors

including key NGOs, educational institutions and leadership foci throughout the country.

The Action Plan also links in with relevant national health policies. Examples of critical reviews of current legislative measures and the recommendations that evolve within that context for upgrading them to meet public health objectives, particularly in the area of tobacco use, injuries, food and physical activity-related legislation, help to highlight this approach.

1.1.6 Relationship with the development agenda

Poverty eradication has assumed a centre stage position in the global development scenario. However, in addressing health issues within this framework, global attention remains focused on health-associated goals embodied in the Millennium Development Goals (MDGs). The cost of neglecting NCDs remains unrealized. Appropriate investments in the prevention of NCDs can save individuals from long-term and/or catastrophic health spending and hence have implications for poverty eradication.

However, in order to table the prevention of NCDs on the global development agenda, there is a need to evolve an approach that sets within the milieu of current priorities for investment in the development sector. Contemporary poverty reduction efforts involving donor recipient interfaces have features that are conducive for integrating the prevention of NCD agenda.

The Poverty Reduction Strategy Paper (PRSP) framework, which has been stipulated as a condition for debt relief by the World Bank and the International Monetary Fund (IMF), is making it increasingly necessary for developing countries to demonstrate that any additional resources made available to them through debt relief would be spent in a manner that benefits the poor.[17] The Action Plan sets well within the existing PRSP framework. Elements vital to the success of the Action Plan such as a concerted attack on diseases, shift from curative to preventive healthcare, participation of country leadership in the preparation of the national strategy with active involvement of the private sector through technical resources and recommended donor coordination in country goals are synchronous with the PRSP.

NCDs have implications for poverty eradication

Recent modifications in effective aid management and health sector development have introduced the sector-wide approach under which donors provide funds to the developing countries through national budgets. Although there is empirical evidence of the value of this approach in terms of ensuring that money is spent on country priorities and is managed by existing structures, there are also several potential risks, particularly as the controls may lie exclusively with governments.[18] Consequently, while there is a need to establish explicit, transparent and independent scientific methods for the monitoring and evaluation of this configuration and for ensuring accountability, it is also essential to ensure active representation of key stakeholders including the private sector. The experience outlined here can help to refine the country strategy in relation to the sector-wide approach. In addition, it can provide empirical evidence relating to the impact of the private sector's active engagement in this framework.

1.1.7 Unrealized ancillary benefits

The strategy outlined in this Action Plan has many ancillary benefits that have not been addressed directly. The Action Plan brings health benefits to all other age groups, assists with healthier lifestyles that are essential to reproductive health, enables a reinforcement of the nutritional strategy and promotes prevention-related practices, which have implications for disabilities such as cataract. The Action Plan is also in line with the International Plan of Action on Ageing, which was agreed by all UN members states at the Second World Assembly on Ageing and with the 'Active Ageing Policy Framework' launched by the World Health Organization at the same opportunity.[19,20] Moreover, the evidence-based approach to NCDs can serve as an example for other settings within the health sector.

1.2 Action Plan-specific descriptions and clarifications

Several aspects of this Action Plan necessitate a description for clearer comprehension of its structure and the recommended course of action. The following section highlights specific aspects.

1.2.1 Definition of NCDs

Though the concept of what may be included in NCDs varies widely, the term is technically reserved for a group of preventable diseases linked by common risk factors; cardiovascular diseases, chronic lung diseases, cancer and diabetes fall within this category. Injuries and mental health illnesses, on the other hand, are classically addressed under separate public health domains. In Pakistan's healthcare context, however, these disease domains were included in the Action Plan as it was felt that this initiative would provide an opportunity for addressing these important areas in the health sector. Injuries, in particular, have been included owing to lack of previous efforts; and mental health because this effort was envisioned as enabling the consolidation and further building upon the several significant public health efforts that have already been initiated to advance the cause of mental health in Pakistan over the last decade. The following chapters of the document, therefore, focus on six NCD areas. Tobacco use is the only risk factor that has been addressed as a separate entity owing to the complexities of the public health response. Tobacco and several other risks addressed under a particular disease domain have cross-cutting relationships as causal risk factors with other diseases. For example, a healthier diet has implications for the prevention of cardiovascular diseases, diabetes and cancer. These have been referred to, as appropriate, in the text.

1.2.2 Focus of the Action Plan

Notwithstanding that activities originating in different parts of the health sector need to be synchronized for a concerted action aimed at reduction in disease-related mortality and morbidity, it is clear that wherever the potential for preventability exists, it must be capitalized upon and maximized. Consequently, this Action Plan focuses on disease prevention, risk factor control and health promotion. It is important to recognize that in this framework, prevention is concerned with avoiding diseases whereas

promotion is about improving health and wellbeing. Both approaches are overlapping and complimentary; they can be present in the same programme with similar activities and hold different meanings for two groups of targeted populations with different results. The public health approach to NCDs offers one of the best opportunities to combine prevention and health promotion to improve multiple positive outcomes.

1.2.3 What constitutes evidence?

An important aspect of the Action Plan relates to the meaning of *evidence* used in this context. Technically, 'evidence includes information that is appropriate for answering questions about the effectiveness of an intervention; the applicability of the effectiveness data; the intervention's positive or negative side-effects; and the economic impact and barriers to implementation.[21] However, in a public health context, invoking a standard of evidence appropriate for clinical decisions is often neither attainable nor applicable for decision making. The strongest evidence with respect to the need and justification for a major increase in investment in prevention is the present burden of NCDs itself; this is evidence of the adverse effects of past and present policies and practices.

A call for further research as a precondition for undertaking prevention programmes is, therefore, unwarranted on the grounds of the consequent and possibly prolonged delay in taking reasonable action to generate knowledge that is already available. Action accompanied by rigorous evaluation and up-gradation of programmes and policies is the best and most timely approach.

In the context of designing and implementation of public health interventions, evidence for prevention and promotion has also been drawn from best practice examples. Furthermore, components within the **IFA** incorporate process evaluation strategies in addition to outcome evaluations which will enable the generation of locally-relevant evidence for appropriate modifications of prevention programmes in future.

1.2.4 Relationship with health systems structure in Pakistan

Another important explanation relates to the relationship of the Action Plan with the health systems structure in Pakistan. From the manner in which the implementation of the first phase of the Action Plan will be executed, it may seem that this is a federally administered programme.[22] This may seem out of line, given that *health is a provincial subject in Pakistan*. However, a closer look at the Action Plan and its **IFA** will highlight that this is not entirely the case. Though the Action Plan will be administered at a central level, it is not a vertically administered programme.

The federally administrative structure has been warranted because of several considerations. Firstly, key **IFA** items, which require rigorous technical support at inception and follow up, are best centralized for quality assurance. This obviates issues of capacity at local levels. Several interventions stipulated in the **IFA** need a centralized focus in any case; setting up of the surveillance system and media interventions are optimally rolled out from a central base with regional inputs as appropriate. Others need to be centrally administered by requirement; the Lady Health Workers (LHWs) and the BDN programmes are administered at the federal level. Moreover, policy and

legislative measures taken at the federal level are binding in the provinces, which is why these federally-developed instruments are envisaged as being appropriate for the desired trickle down effect in the provinces.

However, a part of the Action Plan, which relates to reorientation of health services, will be implemented through horizontal integration with existing primary healthcare programmes within the provincial and district domains and with their active collaboration. The implementation modalities allow for the incorporation of appropriate guidance from the provinces; this is viewed as being critical to the success of these interventions.

One of the strengths of this programme is its capacity to impact health indicators in the remotest village located in a far-flung district by way of interventions structured at the central level, harnessing the support of the private sector and straddling existing programmes. The first phase of the Action Plan,[22] focuses on areas which can be administered at the federal level without delay; however, subsequent actions need to be more closely integrated with provincial mandates.

1.2.5 Priority setting

Priority setting is imperative for the rational utilization of resources for public health programmes in a country. A priority setting process was, therefore, a major area of focus in the Action Plan. As a preliminary step in this direction, the Combined Approach Matrix (CAM),[23] was used to assist with setting priorities. This approach was found to be a useful tool for organizing information; however, this tool uses cost-effectiveness as a yardstick for setting priorities. In the absence of locally available data, it pointed to the need for generating such data.

Priority setting is imperative for the rational utilization of resources for public health programmes in a country

A number of important criteria were identified for priority setting as part of this Action Plan. These included the extent to which an intervention could be locally feasible, promote community empowerment and participation, build on the strengths of partnerships, address social and economic determinants of health and the extent to which it included capacity building and contributed to health systems strengthening. In addition, the existing capacity within the public health system to integrate NCDs and existing leadership and platform, within the private sector, from which to implement this programme were also identified as important criteria. Present level of knowledge related to cost-effectiveness of interventions based on examples in the developed countries was also regarded as being important.

An attempt has been made to strike a balance between primordial, primary and secondary prevention and between the population and high-risk approaches to primary prevention. It has been recognized that the strategy with the greatest potential is the one directed at the whole population and not just at people with high levels of risk factors or established disease.[24] Reduction in population risk has, therefore, been identified as one of the priority areas as part of this Action Plan on the premise that such an approach will shift the distribution of risk in entire populations in the favourable direction. Based on this understanding, a population-based approach encompassing legislation, regulation, mass education and behavioural change communication strategy has been given greater priority. The need to develop

……invest in capacity-building……

data sources has also been regarded as a priority. Priority areas have been flagged in the Action Agenda at the end of Sections 3-9; similarly, they have also been marked on the IFA.

The **Integrated Framework for Action** helps to narrow down the focus of the Action Plan and outlines priority areas. Within this framework, the first phase of implementation of the Action Plan is already is in the pipeline. Under a formally approved PC 1,[22] allocations have already been made to support a population-based NCD surveillance system, a behavioural change communication strategy and a communication campaign at the grass roots level utilizing LHWs of the National Programme for Family Planning and Primary Health Care. However, at the same time, there is a need to identify further concrete steps on an ongoing basis and to align priorities amongst other selected activities with potential for immediate implementation. The tripartite collaboration must foster an active process to ensure this with sustained commitment.

1.3 Challenges, risks and mitigates

The Action Plan has charted a course of action for addressing NCDs in Pakistan in a prevention and health promotion paradigm through broad-based consensus. This course of action has been guided by a situational analysis which has outlined the present state of affairs, strengths and gaps and the opportunities to build upon existing efforts.

A series of deliberations held with a range of stakeholders in the outlined NCD domains has facilitated the development of a strategy to bridge these gaps. The seven chapters that follow focus on each of the domains. In addition, the **IFA** captures the synthesis of the consensus, narrowing down the broad mandate into a crisp focus. It has been developed to provide guidance to administrators and sets a roadmap for health policy implementers. The Action Plan is structured to impact a set of indicators aimed at reducing mortality and morbidity related to NCDs.

Though the ingredients of this public health strategy are sound, there are several limitations of this approach; efforts have been built in this initiative to mitigate these.

Firstly, the Action Plan needs to be supported by a clear, strong and sustained political and policy commitment; this is even more important because of the long-term and life-course outlook of the strategy. This presents a formidable challenge. Efforts have been made to mitigate this risk at different levels. The signing of an official Memorandum of Understanding to lay down the terms of reference of various partners involved and the involvement of an international health agency in this partnership to foster a long-term commitment, are part of this approach. In addition, the recent approval of a formal Pakistan Planning Commission project proposal (PC-1),[22] is a significant first step in the phased implementation of the Action Plan.

Secondly, it must be recognized that the successful implementation of the Action Plan rests on the existence of appropriate infrastructure and public health workforce with adequate capacity to perform core public health functions. This has implications for building capacity and related infrastructure as a parallel process. However, in the interim, the Action Plan

....build public health infrastructure

leverages on the technical strength of the private sector partner and utilizes a horizontal approach to integrating the prevention of NCD with currently operational systems. The execution of these projects from a central level through integration with existing programmes is an attempt to obviate issues that could arise with jurisdictional responsibilities as the provincial and local governments play different roles within the same areas. However, infrastructure and capacity issues will have to be addressed to ensure long-term sustainability.

Thirdly, bureaucracies experience difficulties in executing the time-bound synchronized and coordinated actions, which are part of the Action Plan as outlined in the **IFA**. It is here that the autonomous private sector brings flexibility in implementing actions. Although this partnership emanates from within the overall development policy framework, it does have its own challenges. The partnership has been developed in the absence of a clear-cut legislative and procedural framework. This could, on the one hand, result in issues of power relationships with implications for long-term sustainability of the initiative. However, on the other hand, this situation is also being viewed as an opportunity for providing the empirical basis for health sector reforms in the area of pubic-private collaboration. The experience is expected to provide new information to policy makers about the issues inherent to such partnership arrangements.

This example presents a clear imperative for developing a legislative and regulatory framework for public-private partnerships in Pakistan. Such frameworks legitimize relationships, assist with fostering an enabling environment and provide a mandate for the development of ethical guidelines. Moreover, the experience also highlights the need for the development of global norms and standards to guide such actions within countries. The constituents of the partnership arrangement present an opportunity for international actors to deliberate further on this subject. The role of WHO in this regard is viewed as being critical.

The Action Plan is both a policy and an implementation document. Spinning a document that serves both as a guideline for the policy maker and bureaucrat, and is of scientific interest to the public health community, has been a challenge. This dual intent is also reflected in the writing style, where an attempt has been made to strike a balance between the technical, scientific and administrative jargons. This has also necessitated an explanation of specific technical terms as part of the glossary.

Given the diversity and cross-cutting implications of this attempt, for which a relevant precedent does not exist, several gaps can potentially be identified in this effort. Criticism relating to the strength of the epidemiological data, evidence used and definitional issues may, therefore, be valid. There will be plenty of opportunities for further refining this strategy. However, in the face of the urgency to address the escalating challenge of NCDs, a beginning has got to me made!

2

Common Action Areas

Draw support from the network of healthcare providers at the grassroots level

2.1 Context: paradigm of NCDs prevention and control and health promotion

Knowledge of the multidisciplinary characteristics of the prevention-related response to NCDs is one of the guiding principles of the Action Plan – one that allows for a comprehensive and integrated set of evidence-based actions based on valid scientific approaches. The Action Plan calls for a favourable policy and regulatory environment and stresses on the need to build capacity and a functioning public health infrastructure. The pyramid illustrated in Fig. 1 highlights the *prevention tiers* in NCDs; these relate, in particular, to cardiovascular diseases, chronic lung diseases, cancer and diabetes. Those at the base represent healthy risk-free populations that need to be targeted as part of the *primordial prevention* approach to prevent the development of risks and to promote healthy disease-free societies. The tier above represents populations that need to be targeted through primary prevention approaches to modify risk. Those at the top fall in the secondary prevention category, where efforts need to be directed to those that have suffered events, to reduce morbidity and mortality and to prevent the occurrence of recurrent events. Distinct opportunities exist to prevent diseases within the primordial, primary and secondary prevention frameworks through the high-risk and population approaches. Classically, the population approach needs to be set within the framework of community interventions in target sites such as schools, worksites, through the media and by direct community interventions. The high-risk approach to NCDs largely warrants a reorientation of health services in Pakistan to a preventive orientation. It is evident, however, that there is a great degree of overlap. This is particularly important in Pakistan's healthcare and cultural contexts, where community health interventions should logically be structured to draw support from the extensive network of healthcare providers at the grassroots level.

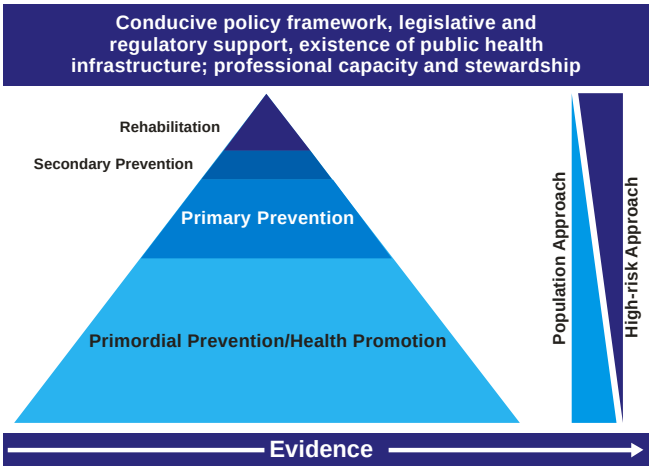

Fig. 1 Paradigm of NCD Prevention, Control and Health Promotion

There is a need to think beyond the public service announcement approach

Notable among these are LHWs and traditional healthcare providers. On the other hand, high-risk approaches, which are primarily offered by healthcare providers, also need to be locally supported within communities. It is, therefore, imperative for both these approaches to dovetail for mutual benefits. The pyramid also helps to highlight the structure of the approaches as they target prevention tiers; community interventions tailing from below above in a manner in which they are key to the primordial and primary prevention approaches. The high-risk approach, on the other hand, is key to secondary prevention but needs to be interlinked with primary prevention. To poise public health interventions in this framework, the Action Plan incorporates several valid approaches that centre on mitigating risks in the primary and secondary prevention settings and stepping up health promotion efforts and screening programmes within target groups and intervention sites. The illustration further highlights the importance of evidence as being the guiding principle for this approach, as is evidenced by the base of the pyramid on which the entire public health framework rests. This public health course of action needs to be set within a broader policy framework. Streamlined public health systems with adequate infrastructure and capacity are also a key requirement. This makes a strong case for capacity and infrastructure development.

2.2 Common action areas in the IFA

The **Integrated Framework for Action** has been discussed in Section 1. It encompasses two sets of strategies – those that are *common* across the entire range of NCDs and others that are *specific* to each NCD domain. The first strategy includes behavioural change communication, reorientation of health services and monitoring and surveillance, while the second pertains to legislative and regulatory matters.

The general principles and structure of community interventions, reorientation of health services strategy and certain aspects of research apply across all NCD domains and are, therefore, being discussed as a common theme. The general framework that relates to these modalities is being outlined in this section. However, specific aspects will be detailed in the relevant sections.

2.2.1 Behavioural change communication strategy

The aim of community interventions as part of this Action Plan is to support the evolution of a set of cultural practices that get embedded as lifestyle habits within the population of Pakistan. As part of this approach, the **IFA** focuses on modifying individual, group and community behaviour through media and other community interventions and targets individuals in appropriate settings. The Action Plan recognizes the need to think beyond the public service announcement approaches and stresses on using behavioural research in areas such as persuasion and large group process that the advertising field utilizes. Increased consistency in public health messages that are coherent and mutually reinforcing and the use of social marketing approaches is recognized as being the key to this exercise. Drawing journalists into this loop has also been recognized as being important. The **IFA** focuses on the use of the media and direct community interventions at

the grassroots level; these need to be structured to reach out to different segments of the Pakistani population with diverse origins, cultures and levels of education. The tightly-knit community structure in Pakistan can be conducive to disseminating messages. In this context, active involvement of local opinion leaders, clergy, religious leaders and community activists in changing social norms has been recognized as being important. Mosques and places of communal meetings can be regarded as natural sites for advocating behaviour change. By western standards, our public health systems are ill-equipped and under-funded to implement comprehensive policies for the prevention and control of NCDs. However, there are channels such as those created through primary healthcare and social welfare activities, which have outreach at the grassroots level and integrate public and private sector health services with the community. These channels must be utilized for cost-effective outreach.

Strong recommendations have been made to utilize educational institutions for advancing prevention-related goals. These are recognized as natural sites, innate for such efforts for two distinct reasons; firstly, because of the availability of infrastructure and secondly, because of the potential that exists to modify behaviour at a younger age. The Action Plan calls for a less categorical approach to school health and recommends integration of the prevention agenda with the academic curriculum, allowing room for local adaptations. In addition, several common risk factors over a variety of outcomes have warranted that preventive messages be packaged not just around NCDs but for a range of preventive measures.

The Action Plan has taken into account, validated demonstration projects in Pakistan that have tested intervention approaches, albeit on a limited scale. These experiences are important for generating the required knowledge for expanding the base of such initiatives and replicating them elsewhere. Such experiences have also been recognized, as part of this Action Plan, as an opportunity for building the skills necessary for the prevention of NCDs.

2.2.2 Reorientation of health services

Utilize experiences from validated demonstration projects in Pakistan

Reorientation of health services to a more preventative orientation for NCDs has implications for training and capacity-building of health professionals, up-scaling of basic infrastructure and ensuring availability and access to certain drugs at all levels of healthcare.

2.2.2.a Training of health professionals: there are three specific roles that healthcare providers can play to advance the agenda for the prevention and control of NCDs and health promotion. Firstly, they can act as local advocates and play a role in influencing lifestyle decisions – both by reinforcing community interventions and/or by acting as the primary source for disseminating information; hence, they can play a key role in patient education. Secondly, health service providers can play an important role in risk assessment and management and thirdly, they can play a critical role in early detection and screening is critical.

Screening approaches have several advantages – they serve as a clinical entry point to risk factor-related counselling and are a key to comprehensive risk assessment and modification. Screening approaches usually involve an active

Introduce sustainable CME programmes

role of healthcare providers. However, in some cases such as in case of breast self-examination and oral examination for cancers, screening can be performed by individuals themselves. Even in such cases, healthcare providers play an important role by verifying and following-up on the course of management. Early detection or screening approaches for biological risk states and diseases need to make a distinction between *population screening* and *screening of high-risk groups*. There are several considerations that help to make this distinction. These include prevalence of the risk state in the general population, potential of impact on mortality and morbidity through early detection, costs involved in the screening procedure, capacity of healthcare providers to perform the screening test, availability of the necessary screening infrastructure and feasibility of mitigating risks through cost-effective therapeutic interventions once diagnosed. Scaling up of population and high-risk screening demands an active role of healthcare providers.

Since healthcare delivery in Pakistan is characterized by a variety of roles played by different categories of healthcare providers, it is imperative to draw all into the loop in order to upscale early detection and screening practices. The bulk of healthcare delivery in Pakistan is carried out through formally and informally trained and traditional non-physician healthcare providers; the Action Plan outlines that they must be drawn into the loop to maximize the impact of activities for the prevention of NCDs. Integration of the prevention of NCDs into the work-plan of all categories of healthcare providers is, therefore, one of the cornerstones of this initiative.

Capacity-building and training programmes should have a three-pronged focus: firstly, they should provide guidance to healthcare providers on counselling, information dissemination and patient education. Secondly, they should sensitize them to the need for stepping up screening practices in population and high-risk groups and thirdly, they should incorporate simplified risk assessment and management protocols. Trainings should be in congruity with community interventions to impact the same set of indicators. This has been highlighted in the **IFA**.

The Action Plan recommends the development and introduction of structured training programmes focused on the prevention of NCDs for medical students and all categories of healthcare providers. These need to incorporate scientifically valid, culturally appropriate and resource-sensitive training packages, which must be delivered through transparent mechanisms. Ideally, such training activities should be set within a sustainable and comprehensive continuing medical education (CME) programme structured around broad-based prevention-related goals and objectives. Establishing appropriate linkages with provincial health departments, the Pakistan Medical and Dental Council, College of Physicians and Surgeons in Pakistan, university departments, medical schools and medical and professional associations is the first step in towards the achievement of this objective.

Physician and non-physician healthcare providers in the public sector [(male paramedics and Lady Health Visitors (LHVs)] are offered regular trainings by the District Health Department-owned District Health Development Centres (DHDC). This offers an opportunity for the introduction of

practically relevant training packages into their work-plans in liaison with the District Health Departments. It is also feasible to introduce such modules into the work-plans of LHWs of the National Programme for Family Planning and Primary Health Care. This has already been initialized as part of the first stage of the first phase of implementation of the Action Plan.[22]

Structuring CME programmes on an ongoing basis for physicians, particularly those in the private sector, on the other hand, is a more complex situation as no formal and sustainable training mechanisms exist with which to integrate such efforts. The Action Plan recommends the structuring of a comprehensive CME programme to ensure ongoing capacity-building of private and pubic sector physicians. Such a programme will ensure training of in-service doctors as a permanent function of the healthcare system in Pakistan. However, pending such a structural and sustainable change, the existing models of healthcare provider training need to be evaluated for effectiveness and sustainability and adapted to the prevention of NCDs.

The prevention of NCDs can also be developed as a form of specialization for non-physician healthcare providers. The feasibility of this approach needs to be further explored.

2.2.2.b Infrastructure at healthcare settings: assessed from the perspective of the prevention and control of NCDs, infrastructure requirements of healthcare facilities are modest. An assessment of basic health facilities was recently conducted in the outskirts of Islamabad in collaboration with the Geneva-based CVD Unit of WHO.[25] This revealed that blood pressure measurement devices and weighing scales are universally available in all healthcare facilities; however, only around 50% of them were found to be in working order; there was also no system for calibrating and maintaining equipment. Ensuring the availability of a calibrated blood pressure measurement apparatus should be made universal as this is a prerequisite for stepping up screening for high blood pressure. Simple risk assessment tools such as tape measures and apparatus to measure urine sugar are affordable; efforts should be made to make these available at all levels of healthcare facilities.

2.2.2.c Drugs at the basic healthcare level: the availability of and accessibility to several drugs is important in the context of the prevention of NCDs. These include beta blockers, ACE inhibitors, aspirin, penicillin, phenobarbitone, chlorpromazine, imipramine, procyclidine, diazepam, sulphonylureas and insulin; however, this list is in the process of being updated. In addition, nicotine replacement should be made available wherever feasible. A review of the Essential Drug List (EDL) in Pakistan reveals that most of these drugs are listed on the EDL. The Drugs Act 1976 makes it necessary for these medicines to be available throughout the country.[26] However, an on-ground assessment has revealed that there are several gaps in the availability of these medicines in healthcare facilities. A facility capacity assessment conducted in collaboration with the WHO CVD Unit has revealed that many of the essential drugs necessary for primary and secondary prevention of NCDs were not available at all times in healthcare facilities even though they were affordable and widely available in the market.[25] It is, therefore, essential that necessary steps be taken to ensure that

these drugs are made available and accessible at all levels of the healthcare system.

2.2.3 Research

This Action Plan attempts to bridge the gap between academic researchers and policy makers and administrators engaged in planning evidence-based strategies for bringing about an improvement in health outcomes. Several research dimensions have been flagged as priority areas as part of this Action Plan. These research areas underlie the need to move away from the sole focus on risk factor and etiological research towards surveillance and intervention research to facilitate an assessment of the effectiveness of current policies, disease trends and future health needs.

A necessary prerequisite for effective planning, implementation and evaluation of NCD prevention programmes is access to reliable and timely information on mortality, morbidity, risk factors and their socio-economic determinants. This approach has been validated in several settings: WHO STEPwise approach to Surveillance (STEPS),[27] the Behavioural Risk Factor Surveillance System (BRFSS),[28] of the Centers for Disease Control (CDC) in USA, and the use of various database sources such as the WHO Global NCD InfoBase and those used as part of the CINDI and CARMEN regional programmes of WHO. The need to bring together and display existing data is a useful starting point for assessing its quality and availability from the perspective of its ability to give meaningful data over time; it can act as an entry point for activities related to the prevention of NCDs. Standardised epidemiological information greatly facilitates comparative analysis and ongoing modification of interventions. In Pakistan, lack of comprehensive databases for NCDs presents an obstacle to effective priority setting, targeting of programmes to various population groups, evaluation of process-related activities and long-term evaluation of preventive interventions. The adoption of practical and economical systems to meet these needs have, therefore, been recognized as part of the Action Plan.

There is some potential for strengthening and upgrading conventional data sources such as those that presently exist within administrative systems, public health and primary healthcare structures, individual files, death records and hospital data within the healthcare system in Pakistan. These data sources, however, suffer several limitations. These include lack of systematic data collection systems and population-based data on NCDs; lack of data for population subgroups with heterogeneous health characteristics; relatively small sample sizes in cross-sectional surveys; lack of longitudinal studies; and self-selection bias in sampling methods. By and large, existing data sources in Pakistan do not serve the purpose of monitoring population parameters, which this Action Plan aims to impact. For this reason, a more comprehensive, integrated, systematic and sustainable population-based data collection infrastructure needs to be established, maintained and expanded over time. This can then be supplemented by facility-based data collection systems and stand-alone data sources wherever applicable. Appropriate linkages with institutions such as the Pakistan Medical Research Council (PMRC), which can provide sustainable support for surveillance activities, should be an integral part of this approach.

NCD surveillance and cost-effectiveness studies are priority research areas in the Action Plan

With the exception of cancer and stroke, disease surveillance is not appropriate for Pakistan as deaths are not registered. This notwithstanding, the feasibility of establishing a mortality sentinel site must be assessed; such data sources can provide adequate information to generate reasonable estimates of mortality in large populations. However, in view of the limited resources that may be available for surveillance monitoring, the **IFA** has developed a common population surveillance mechanism for all NCDs (with the exception of cancer). The model includes population surveillance of main risk factors that predict many NCDs and combines modules on population surveillance of injuries, mental health and stroke. Guidance has been sought from the WHO STEPWise approach; this offers standardized methods and materials for country-specific information on adult populations. Optional STEPS modules on mental health, injury and stroke have also been included in the surveillance model. The model has also incorporated components from the BRFSS module. In addition, it has been adapted for programme evaluation; this will enable it to track implementation processes using appropriate indicators, facilitating an assessment of how interventions work and which components contribute most to success. This will enable the surveillance model to measure outcomes and evaluate processes both qualitatively and quantitatively. Efforts will be made to build on similar data that have already been collected in Pakistan.[29]

Cost-effectiveness studies have been identified as another priority area for research as part of this Action Plan. While data on the subject exist, there are not enough studies that are applicable and relevant to our setting. Since the results of such studies can better inform decision making for policy purposes, these must be actively disseminated to policy makers, professional practitioners and the community. Cost-effectiveness of preventive strategies can significantly contribute to gaining support from healthcare authorities for such programmes.

The third priority area for research focuses on identifying causal associations for risk factors that have implications for setting targets for preventive interventions. This has been referred to in detail in the relevant sections.

3

Cardiovascular Diseases

Nearly 85% of the global mortality and disease burden from CVDs is borne by low- and middle-income countries

3.1 Context

The Cardiovascular Disease (CVD) epidemic in the developing countries has been well highlighted in reports of WHO,[30] and the World Bank,[31] and the Victoria,[32] Catalonia,[33] Singapore,[34] and Osaka Declarations.[35] At a global level, occurrence of 17 million annual cardiovascular deaths, 32 million annually reported heart attacks and strokes and existence of hundreds of millions of those suffering from CVD risk states, help to draw attention to the scale of this epidemic.[36] Nearly 85% of the global mortality and disease burden from CVDs is borne by low- and middle-income countries. This trend has grave implications for economically disadvantaged populations in south Asia, who inherently have a higher coronary risk but limited opportunities to access high-cost tertiary cardiovascular care.[37]

Pakistan's health sector investment in the area of CVDs has, in the past, been predominantly focused on tertiary care; two of the six federal government centres of excellence in *specialized fields of medicine* have been dedicated to CVDs.[i] There are many others that fall under the jurisdiction of the provincial governments. As a contrast, the public health approach has not featured prominently on the health agenda despite repeated calls to action highlighted in technical writings drawing attention to the escalating burden of CVDs in the Pakistani population.[38-42]

There is, therefore, the need to prioritize the disease prevention, risk factor control and health promotion approach to CVDs in Pakistan. This is all the more urgent with evidence showing that appropriate investments in prevention can reduce the incidence of CVDs.[43]

Cardiovascular diseases include diseases of the heart and the blood vessels. In the prevention-related terminology, preventable CVDs refer to two groups of diseases – those that are a result of the atherosclerotic process such as coronary artery disease (CAD), stroke and peripheral vascular disease and their associated risk factors on the one hand, and hypertension and its sequels, on the other. There is considerable overlap between these two groups as hypertension is also a major risk factor in the former category. Moreover, common preventive strategies are applicable across the range of preventable CVDs.

In the Pakistani setting, rheumatic heart disease (RHD) is another form of preventable CVD and needs to be addressed in the prevention and control

[i] Armed Forces Institute of Cardiology (AFIC), Rawalpindi, and the National Institute of Cardiovascular Diseases (NICVD), Karachi.

CAD has a younger age of onset in Pakistan

framework. This has been separately discussed, later in this Section as the dynamics of the public health response to the issue differ from those applicable to hypertensive and atherosclerotic heart disease. Rheumatic heart disease is a cardiovascular consequence of an infectious illness, which is characteristic of the early stages of the epidemiological transition in the high mortality developing countries with high infectious burden. The persistence of the RHD burden, in parallel with high atherosclerotic disease burden, is evidence of the double burden of diseases in Pakistan.

3.2 Data on CVDs in Pakistan

3.2.1 Data on coronary heart disease

Expatriate Pakistanis are part of an ethnic group known to have one of the highest prevalence of CAD throughout the world.[44] Observational studies dating back to the early 1960s in Pakistan reported an increase in the number of patients hospitalized for manifestations of CAD.[45,46] In spite of this realization, no significant attempts have been made to study these patterns in populations; presently, there are scant data on CAD prevalence and none on incidence.

Based on self-reporting, data from an earlier cross-sectional household survey in a sampled population of Karachi reported a history of CAD in 1.9% of the affluent and 0.6% of the poor.[47] This study is likely to have significantly underreported prevalence as reliance on doorstep interviews and ascertainment based on household testimony cannot reflect the true occurrence of disease. A more recently conducted population survey on individuals above the age of 40, defining CAD as the composite outcome of abnormalities indicative of definite or probable CAD based on Minnesota classification of ECG or past history of heart attack, has suggested an overall prevalence of 26.9% in men and 30.0% in women. This indicates that one in four middle-aged adults in Pakistan has prevalent CAD, with the risk being uniformly high in the young, and in women.[48] Autopsy data also support high prevalence; data from an unselected autopsy series have shown coronary artery involvement[ii] in more than 24% of those studied.[49,50] In addition, the Pakistan Survey of Health and Living Conditions in the Elderly – a cross-sectional survey of the health status of individuals over the age of 65 years, carried out in five towns revealed that 7% of the elderly reported having been admitted to a hospital with a heart attack.[51]

Limitations with regard to the generalizability of life insurance data and the inherent biases notwithstanding, the reported frequency of cardiac deaths and the younger age of onset in such databases in Pakistan is striking.[52] Data from all these sources, though scant, help to highlight the magnitude of the problem, particularly as it relates to morbidity and mortality in the middle-aged group. This makes an urgent case to institute preventative interventions in the primary and secondary prevention settings.

3.2.2 Data on stroke:

Globally, stroke is the second leading cause of death.[14] In 2001, cerebrovascular diseases (stroke) were estimated to account for 5.5 million

[ii] Of greater than 50% luminal diameter reduction

deaths worldwide, equivalent to 9.6 % of all deaths. Two-thirds of these deaths occurred among people living in the developing countries and 40% of the subjects were aged less than 70 years.[30] Against this backdrop, there are no population-based data on stroke in Pakistan. Collecting mortality and morbidity data on stroke in populations necessitates the setting up of population-based stroke registries; this is fraught with logistic and methodological issues, making it an impractical approach in Pakistan over the short term. The population-based NCD surveillance system as part of this Action Plan, uses risk factor burden as a proxy for stroke burden in Pakistan (raised blood pressure in particular). A module for estimating stroke prevalence has been incorporated in the NCD population-based surveillance system. However, it is recognized that stroke related population measures do not fit well in population surveys.

Several studies have examined the risk profiles of patients presenting with stroke in Pakistan. Raised blood pressure,[iii] has been observed in 23-64% of the patients suffering from stroke; 31-42% were shown to be suffering from diabetes; 33-53% of stroke patients were current smokers whereas 11-17% were found to be overweight. Studies have also shown that a majority suffered from cardiac disease (46%) and hyperlipidaemia (30%) whereas carotid artery stenosis was observed in 8%.[53-58]

Methodological issues with data collection in the reported studies and issues with comparability of data notwithstanding, the reported data show a high prevalence of well established risk factors among stroke patients. In the absence of the identification of precise risk factor causal associations for stroke in the Pakistani setting, traditional risk factors will be used as targets for preventive interventions.

An epidemiological review of risk factors for CAD and stroke and preventive strategies applicable to both are discussed hereunder.

3.2.3 Data on biological risk factors of coronary heart disease and stroke

An estimated 5.5 million men in Pakistan suffer from high blood pressure

3.2.3.a Raised blood pressure:[iv] according to the National Health Survey of Pakistan (NHSP) 1990-94, there were an estimated 5.5 million men and 5.3 million women with hypertension in the years 1990-94. The prevalence of hypertension over the age of 15 years was reported at 17.9%, with a higher prevalence observed in urban areas (21.5% vs. 16.2%). Over the age of 45 years, prevalence was reported at 33%, implying that one in every three Pakistanis over the age of 45 years suffers from high blood pressure. Recent reports have suggested that this difference can be accounted for by body mass and waist circumference.[59] A similar prevalence of 15% over the age of 18 years and 36% over the age of 60 years has been reported in another survey conducted in the Northern Areas of Pakistan.[60] Another population survey also reported similar trends, with prevalence estimates of 31.5% (above 140/90 mm hg); 11.9% of the individuals above the age of 40 were reported to have blood pressure levels above 160/100 mm hg.[61] The National Health

[iii] Defined as a blood pressure level of = 140 mm Hg systolic

[iv] Defined as a blood pressure = 140 mm Hg systolic and or 90 mm hg diastolic and/or taking antihypertensive medication

Survey of Pakistan further reported a hypertension control rate of 3%, which is among one of the lowest control rates in the world.

3.2.3.c Obesity and overweight: although a substantial segment of the population suffers from problems related to under-nutrition, obesity is emerging in Pakistan as a public health problem. During the NHSP, measurements were taken to determine the Body Mass Index (BMI) distribution of the population. Overweight in adults was defined as BMI = 25 as recommended by WHO. From the NHSP data, the proportion of adults classified as overweight generally increased with advancing age. It was higher in women compared with men and higher in urban versus rural areas. In the age group of 25-44 years, 9% of the rural men were overweight compared with 22% of the urban men; for women, prevalence of overweight in rural areas was 14% versus 37% in urban areas. When stratified by age, sex and residence, prevalence of overweight was highest (40%) in urban females aged 45-64 years. While the cut-off points of BMI = 25 to define overweight, and BMI = 30 to define obesity is generally accepted, the WHO Regional Office for the Western Pacific, and the International Task Force for Obesity published provisional recommendations in 2000 for adults of the Asia-Pacific region: overweight at BMI = 23, and obesity at BMI = 25. The recommended lower cut-off points for BMI for the Asia-Pacific region compared to western countries is based on studies demonstrating increased risk of co-morbidities at lower BMIs in Asians, who tend to accumulate abdominal fat at lower BMIs. Use of lower cut-off points would reclassify a greater proportion of the Pakistani population as overweight; furthermore, the figures quoted above for the NHSP data would specify prevalence of obesity in Pakistani adults. This would imply that the health burden from overweight and obesity in Pakistan is currently underestimated. [62,63]

An estimated 5.3 million women in Pakistan suffer from high blood pressure

3.2.3.b Dyslipidaemia: the National Health Survey of Pakistan reported that 12.6% of the total population over 15 years of age or over 7.3 million people have high blood cholesterol levels. In addition, data from the Four Cities' Study of Pakistan reports that 31% of the adults have raised blood cholesterol levels; both surveys used a cut-off point of 200 mg/dl. A study carried out on children in Karachi has revealed that more than 62% girls and 54% boys have cholesterol values greater than, or equal to 4.4 mmol/l (170 mg/dl) – a level at which dietary intervention is recommended for children.64 Reported data have implications for preventive interventions both for children and adults.

For data on diabetes, refer to Section 4.

3.2.4 Data on lifestyle-related risk factors common to major NCDs

In Pakistan, limited attempts have been made at collecting population-based data on diet and physical activity with validated instruments. It is, therefore, essential to include these risk factors into the NCD surveillance system. This needs to be preceded by validation of tools of assessment in the local setting in Pakistan.

For data on tobacco, refer to Section 5.

3.2.5 Gender and rural-urban differences in risk factors

Available data highlight that women – particularly obese women in urban areas – have higher risk factor levels compared with men. More than 40% women between 45-64 years of age are reported to be obese in urban areas; amongst these, 65% are hypertensive and 25% suffer from diabetes.[5] Against this backdrop, inactivity of women and girls in crowded urban areas is a barrier to advancing cardiovascular health.[65] This is compounded by cultural, social and religious factors that discourage women from engaging in physical activity.[37]

A discussion on risk factors in the Pakistani setting cannot be complete without referring to possible rural-urban differences. Rural communities in south Asia are shown to have lower risk factors than the urban westernized; this may be attributable to a low-fat (15-20 grams/day), whole grain-based diet (400 g/day) and physically demanding occupations.[66,67] There are scant data relating to such differences in Pakistan; this highlights the need to assess possible differences in rural-urban risks and their determinants. Such assessments will have implications for appropriate preventive measures. Risk reduction strategies should focus on promoting healthier habits in the face of rapid rural to urban migration in the native south Asian setting.

Table 3.1 Prevalence of CAD and common risk factors for NCDs in Pakistan

	Rural %	Urban %
Coronary Artery Disease? †		
Men	..	26.9*
Women	..	30*
Hypertension? ‡ [5]	16.2*	21.5*
Men	18** - 25***	28** - 37***
Women	15** - 28***	25** - 43***
Overweight? ‡ [5]		
Men	9**	22**
Women	14**	37**
Diabetes?† ?	6.39-13.5*	10.8-16.5*
Men	10.3*	11.1*
Women	4.8*	10.6*
Smoking‡ [7]		
Men	39.13*	30.51*
Women	12.5*	
Oral smokeless tobacco‡ [5]	10*	
Dyslipidaemia? ‡ [5]	12.6*	

‡ National data † Regional data
*Age 15 years and above **Age range: 35-44 years ***Age range: 45-64 years
? Using electrocardiographic criteria ? Defined as a blood pressure level = 140 mm Hg systolic and/or 90 mm Hg diastolic and/or taking antihypertensive medication
? Defined as a BMI of = 25 ? Defined as a random blood sugar level of = 140 mg/dl
? Defined as a total cholesterol level = 200 mg/dl
? Refer to table 4.1 for references

The emphasis is on modifiable risks

The section above focuses on prevalence of risk factors. However, describing prevalence of CVD risk factors from a prevention point of view is restrictive as the largest proportion of CVD events in any community arise from persons who have moderate elevations of many risk factors than from individuals with marked elevation of a single risk factor. This spells out the need to address the risk factor distribution in a population rather than merely dealing with those at the extreme high end. This makes the case for population-based interventions even stronger.

3.2.6 Risk factor causal associations

In summary, there are scarce data available on CAD prevalence and none on CAD incidence in the indigenous Pakistani population; prevalence of traditional risk factors is known to be high. Studies carried out on expatriate Pakistani populations,[68] data from the locally conducted RISKCORN Study and emerging data from the INTER-HEART Study and locally conducted studies reveal that the CAD risk profile in Pakistanis differs from what has been established for western populations.[69,70] In addition, the pattern of CAD differs with a predilection of younger onset, aggressive and widespread disease.[71,72]

These data suggest immediate need for preventive interventions. Based on available data on established risk factors, goals and targets for risk modification can be defined. However, there is a need to establish risk factor causal associations in the native Pakistani setting so that precise targets for preventive interventions and goals for risk modification can be defined. Risk factor causal associations have not been identified at a population level in the native Pakistani setting; however, a recently reported hospital-based case control study has revealed that the cardiovascular risk profile of the Pakistani population is consistent with the metabolic syndrome where low HDL and waist hip ratio can be used to predict the risk of CAD.[69] Such data have important implications for secondary prevention practices in Pakistan and highlight the need for clinical end-point trials to be conducted in the native Pakistani setting in order to define the best therapeutic strategy for treatment of CAD weighing benefits against economic feasibility.

The pattern of CAD in Pakistan (with a predilection for aggressive early onset) suggests that there may be an underlying genetic component to the disease upon which the environmental factors interact.[73,74] Numerous polymorphisms in candidate genes have been associated with CAD, hypertension, hyperlipidaemias, glucose intolerance, hyperinsulinaemia, and hyperhomocysteinaemia in various population groups;[75] these need to be analysed in Pakistani population. Studies in Pakistan, although limited, found a significantly higher frequency of the ACE I/I genotype in young (aged < 40 years) hypertensive patients.[76] Studies have also reported an association between CAD and high lipoprotein (a) [Lp(a)] and low HDL levels in the Pakistani patients.[69] Future studies should expand on these observations with the objective of exploring polymorphisms in candidate genes and loci that predict the risk of CAD in Pakistani patients. This may allow clinicians to predict the risk of CAD, rationalize therapy and enforce lifestyle and dietary

preventive measures with long-term economic benefits gained through reduction in morbidity and mortality.

3.3 Preventive strategies: atherosclerotic and hypertensive heart disease

The prevention paradigm as it relates to CVDs (atherosclerotic and hypertensive heart disease) has been referred to in Section 2. As discussed, the prevention and control of CVDs and health promotion need to be targeted in the primordial, primary and secondary prevention settings through the population and high-risk approaches; these centre on community interventions and reorientation of health services. The emphasis in this section will be on modifiable risks and screening for early detection of diseases and biological risk states, where significant gains can be achieved by early intervention. Four of the key modifiable lifestyle risk factors have been discussed in this document – tobacco use, physical activity, diet and stress. Of these, three will be discussed here while tobacco has been discussed separately in Section 5. Modification of risks through lifestyle changes is common to primary and secondary prevention of CVDs. Early detection approaches involving screening will be discussed as part of the population and high-risk approaches. Congruous with early detection approaches is the management of high-risk biological states. Management of high-risk states has some common ground in the primary and secondary prevention approaches, though distinct differences exist. These differences need to be addressed in technical guidelines.

3.3.1 Mitigating modifiable lifestyle-related risk factors

The discussion on modifiable risk factors summarizes issues that are specific to each risk factor; these include legislative and regulatory matters. Principles of the behavioural change communication strategy and the reorientation of health services strategy as these relate to individual risk factors are common and have already been discussed in Section 2.

3.3.1.a Tobacco: tobacco is the single most important preventable cause of CVD, chronic lung disease and cancer. Peculiarities of the prevention and control-related characteristics of this risk factor have necessitated its discussion in a dedicated section.

3.3.1.b Diet: diet is known to be a major modifiable risk factor for several chronic diseases including diabetes, CAD, hypertension, stroke and certain types of cancers. In addition, diet also plays a major part in the aetiology of certain biological risk states such as obesity, dyslipidaemia, and impaired glucose intolerance. The potential for preventing some of the key NCDs through dietary modification is known to be significant.[77] Studies have estimated that up to 80% of the cases of CAD, 90% of type-2 diabetes, and one-third cancers could be avoided by altering risk factors in the favourable direction. Eating healthily constitutes a major component of these lifestyle factors; others include maintaining normal weight and exercising throughout the life span.[78]

Evidence suggests that there is a strong causal association of an unhealthy diet with the risk of several chronic NCDs being addressed as part of this

Policy decisions influencing dietary consumption patterns are known to reduce premature deaths

Action Plan. Evidence shows that women who consume a diet low in trans-fatty acids and glycaemic load and high in cereal fibre have a risk of diabetes approximately half that of women who do not.[79] There is convincing evidence that saturated fats, fatty acids found in meat and dairy products[80] and the intake of trans-fatty acids increases the risk of CAD through an adverse effect on the blood lipid levels.[81,82] Replacing 2% of the energy from saturated fats or trans-fatty acids with polyunsaturated fats has been reported to lower the risk of coronary heart disease by 42 and 53%, respectively.[83] Trans-fatty acids are known to be more harmful compared with saturated fat; they are created through hydrogenation – a process used to convert oil into *banaspati ghee* and margarine. Given the widespread use of hydrogenated fats in the form of *banaspati ghee* in Pakistan, this is of particular concern. There is, therefore, the need to examine the pattern of *ghee* manufacturing, marketing and consumption; such assessments will enable the development of policies and strategies to limit the production of, and access to, *ghee* as a medium for cooking. This will have to be paralleled with a strong behavioural change communication strategy to change perceptions about fats used for cooking. There is strong evidence to suggest that consumption of fruits and vegetables, non-starch polysaccharides (fibre), fish and fish oil, as well as foods such as nuts that are high in linoleic acid are associated with reduced risk of CAD.[84,85] Diet is also known to impact high blood pressure. The causal association of high salt intake and excessive alcohol consumption is well established. Inadequate intake of potassium has been shown to have a particularly important role in some population sub-groups such as the African American community. Its role in the Pakistani community needs to be studied. [86-92]

Diet is believed to be second only to tobacco as a preventable cause of cancer.[93] In developing countries, around 60% cancers of the oral cavity are linked to micronutrient deficiencies due to a restricted diet that is low in fruits and vegetables and animal products.[94] On the other hand, a diet high in fats is known to increase the risk of cancers of the colon,[95] breast,[96] and ovaries.[97]

Likewise, populations that are known to have lower rates of chronic diseases are also known to have less adverse dietary patterns.[98] Data from Finland have indicated that 50% of the dramatic declines in CAD mortality as a result of community intervention measures could be attributable to changes in the diet of the population; this was generated by community action and the pressure of consumer demand on the food market.[99]

Dietary interventions – particularly those that involve policy decisions influencing consumption patterns – are known to result in significant reduction in premature deaths.[100] This highlights the need for initiation of major public health action to promote a healthier diet in Pakistan. Most of the evidence in this context to-date has originated from the economically developed countries and therefore, strategies that are referred to have their origins in the western context. The feasibility of their application needs to be tested in the Pakistani setting.

Several economic and socio-cultural dynamics are currently contributing to making food unhealthy in the western world. Higher incomes and falling food prices are boosting the consumption of meat, milk and fatty and sugary items.

The supermarket era, reliance on packaged food and a boom in the distribution technology has increased the use of salt as a preservative. The need to make retail food cheap has necessitated the substitution of butter with hydrogenated oil and the concept of *convenience products* in food and saving cost of labour in mass preparation of foods is driving people to buy more fast food. Moreover, larger portion sizes offered at restaurants in an attempt to *add value* to the *deal* make people eat more. This classical western dietary model offers several opportunities for regulatory public health actions that are aimed at targeting the manufacturer and retailer with implications for production, labelling and shelf choice. However, these dynamics are quite different from what is relevant in the Pakistani setting. Pakistan has a large population; its inherent culture, diversity of the urban-rural divide and heterogeneity in dietary patterns makes it stand distinctly as a population where dietary considerations are unique and where the strategies necessary to promote a healthier diet need to be carved out in a local context. Several issues need to be flagged, from this perspective.

The rise in the burden of NCDs in countries like Pakistan has been paralleled with changes in dietary patterns – a feature of the complex interplay of industrialization, urbanization, economic development and market globalization. Theoretically, this has a huge impact on the health and nutritional status of populations. Against this backdrop, Pakistan's health policy around diet and nutrition remains focused on under-nutrition. There are scant data on dietary patterns relevant to NCDs and the disease burden attributable to an unhealthy diet in the native Pakistani setting. Any effort along these lines will be complicated by the lack of validated tools of assessment and diversity of dietary patterns that exist across the geographic and cultural confines. It is, therefore, important to develop locally relevant and validated tools of assessment and to include assessment of dietary patterns as part of the NCD population-based surveillance system.

Identification of associations of particular dietary intakes with NCDs will enable the identification of factors, which can then be subject for relevant research. Improved understanding of dietary patterns will guide behavioural change communication strategies to be structured accordingly. There is also a need to make an assessment of the kind of policy measures from a public health perspective that stand to gain a better chance of making diet healthier in Pakistan. This should also include an assessment of potential agricultural and fiscal policies and policies relating to the structure of production, transportation, storage and marketing of food items that have implications for increasing the demand for and access to healthy food. Within this context, it is important to develop a nutritional policy along the lines of the WHO Global Strategy on Diet and Physical Activity – such a policy must be endorsed at the Cabinet level; sustained multi-sectoral action must be initiated for its implementation.

Pakistan has no reliable and validated data on physical activity

3.2.1.c Physical activity: lack of physical activity contributes significantly to loss of precious human resource. Physical inactivity accounts for 1.9 million deaths globally; additionally, it accounts for 10-16% of cases each of breast, colon and rectal cancers and diabetes mellitus and 22% of coronary heart disease. Physical activity is both a strong means of preventing diseases

and a means of several social, physical and mental health benefits for individuals of all ages and sexes and a cost-effective method to improve public health across populations.[100] Physical activity has been discussed in the section on CVDs but it needs to be recognized that its beneficial effects extend much beyond CVD prevention. Regular physical activity reduces the risk of dying prematurely and protects against CVD, several cancers and osteoporosis and has a favourable effect on many risk states. In addition, it also has several psychological gains and helps an individual feel and look better and work well. Physical inactivity is an independent risk factor for CAD; it operates through its detrimental effects on blood pressure; cholesterol, insulin and glucose metabolism and obesity.

Against this backdrop, it is known that most adults do not engage in sufficient levels of physical activity beneficial to their health. There are scant data on physical inactivity in the Pakistani population. Moreover, the tools for assessing physical activity have not been validated in the Pakistani setting; it is important for future epidemiological surveys that such tools be developed, standardized and validated. Physical activity offers additional advantages for risk reduction in the Pakistani population since the highly prevalent risk factors amongst this population such as low HDL, central obesity and insulin resistance respond better to exercise.

Stepping up physical activity in a population necessitates bringing about a cultural change. This has two-fold implications; the first involving modification of lifestyles and the second necessitating the creation of a physical and social environment conducive to physical activity.

This calls for aggressive promotion of physical activity as part of the behavioural change communication strategy – physical activity needs to be inculcated as a cultural and behavioural norm. Presently however, physical activity is culturally unacceptable to the vast majority of the female population in Pakistan and should be encouraged in this group in an environment and form that respects religious proscriptions.[69] The Action Plan stresses on the need to generate support from religious leaders, which is seen as being crucial in endorsing the need for full participation of women in Muslim cultures. Urban planning needs to be responsive to the needs of the population in this regard. An enabling environment not only helps to promote physical activity in populations but also creates a greater demand. Setting up of the sidewalk on Margalla Road in Islamabad highlights this example. Though municipalities have stepped up efforts in major metropolitan cities to construct parks, they are far from being adequate. Moreover, they are centred on uptown areas within large cities which make them inaccessible to the poor and marginalized groups and those dwelling in the rural areas. There is also the concern that, in places, these are focused more on the aesthetic aspect.

Making environments conducive for physical activity is generally perceived as a challenge in disadvantaged settings. The situation is more complex in the context of Pakistan, where more than 60% of the population resides in the rural areas. Legislation on urban planning in Pakistan stipulates standards and makes it mandatory to have open spaces and sidewalks; however, there are issues with its implementation as the law is not applicable to existing built up structures and the rural areas.

Heartfile has created several models for CVD prevention in Pakistan

In view of these constraints, other opportunities of local relevance need to be identified. The feasibility of utilizing open spaces and playgrounds in schools, for public use, needs to be explored. The role of private sector actors needs to be fully realized and explored in this regard. Appropriate and ethical linkages can help to maximize such efforts.

The prevention and control of tobacco use has been addressed in Section 5.

3.3.2 Approaches to address risks in populations

A few initiatives as part of existing models in Pakistan focus on creating demonstration models for mitigating cardiovascular risks in community settings. These models, from which useful lessons can be learnt, are discussed below:

3.3.2.a Heartfile models: addressing the CVD issue in a developing country needs a shift away from *high-cost approach* to a *prevention-focused population-based* approach. Within this context, Heartfile has created several models in the Pakistani setting; these range from media interventions to demonstration projects in community settings.[101,102] The Heartfile Lodhran CVD Prevention Project has been developed as a research and demonstration primary prevention project as part of Heartfile's Tier 3 community-based programmes. Launched at the grassroots level in the District of Lodhran, South Punjab, the project targets a predominantly rural population of one million and aims to reduce risk in whole communities.[103] The main hypothesis is that community interventions designed for low-resource settings will reduce the prevalence of CVD risk factors, consequently reducing cardiovascular incidence, morbidity and mortality. The project is projected over a five-year intervention and a two-year transition in which transfer of resources and responsibilities to community organizations and the district government will occur. The principal strategies include community interventions utilizing existing social development structures and integration of CVD prevention with primary healthcare infrastructure. The latter approach involves a project component that has introduced CVD prevention into the work-plan of LHWs of the National Programme for Family Planning and Primary Health Care under an officially signed agreement with the understanding that this demonstration project will serve as a pilot for a nationwide project.[104] This approach is sustainable and contributes to strengthening of the pubic health configuration in addition to influencing primary healthcare towards a more preventive orientation. The Action Plan recommends further strengthening and up-gradation of this module to incorporate preventive elements of other NCDs with the work-plan of LHWs. Work is presently underway in this direction as part of the first phase of implementation of the Action Plan under an officially approved PC1.[22]

3.3.2.b The Metro-ville Study: the National Institute of Cardiovascular Diseases (NICVD), Karachi, has been involved in planning and implementing a pilot CVD prevention project in low- and middle-income communities in an urban setting in the outskirts of Karachi city. Practical collaboration for this initiative has been pooled in by National Heart, Lung and Blood Institute (NHLBI), Maryland, USA. This five-year intervention study was designed to test strategies for CAD risk factor modification in an

Draw all categories of healthcare providers into the loop

indigenous Pakistani setting. The implementation of this preventive strategy has been designed on an experimental model, with pre-evaluation assessing risk factor burden, knowledge, attitudes and practices in the areas of intervention. The primary goal of the intervention was to study the hypothesis that educational efforts among intervention families would increase knowledge and awareness of CAD and its determinants and improve knowledge about effective efforts to prevent CAD compared with control families. Additional goals for intervention households were to reduce salt in cooking by 25%, replace *ghee* in cooking by polyunsaturated and monounsaturated vegetable oil entirely and reduce fat in cooking by 33%. This experience has provided useful lessons for future interventions of the kind. Baseline assessments highlighted the need for a body of well-trained staff for educating community leaders and stressed on the need for establishing effective contact in the community.[105,106] Mid-term evaluation of the project has revealed that such interventions are useful in impacting household practices. The intervention is reported to have been successful in influencing household practices in reducing salt, *ghee* and fat consumption to significant levels.[107] These results provide useful insight into population-based risk factor modification strategies that could be adopted at the household level.

3.3.2.c The Karachi Study: the Department of Clinical Epidemiology at the Aga Khan University Hospital (AKUH) has recently secured funding for a community-based CVD intervention study in Pakistan. This study aims to study population-based strategies for effective control of high blood pressure in Pakistan. The three-year factorial design project, which uses cluster randomization methodology, will assess the impact of different strategies on blood pressure levels and other cardiovascular risk factors. These include population approach of home health education by community health workers and cost-effective management of blood pressure administered by intensively trained local general practitioners.

Lessons learnt from these three community demonstration models will prove helpful in designing similar strategies at the national level.

3.3.3 Screening, risk assessment and management in primary prevention settings

Screening approaches in CVD warrant an active role of healthcare providers as opposed to other approaches that predominantly involve individuals. Self-screening for breast cancer is an example of the latter. In CVD, screening for biological risk states needs to be linked to risk assessment and treatment for optimal benefits. Traditionally, treatment falls under the purview of curative care, which is technically outside the scope of the present discussion. However, in the context of CVD, treatment of risk states inclusive of raised blood pressure, diabetes and raised cholesterol levels is part of both primary and secondary prevention approaches and has, therefore, been referred to here.

Based on considerations discussed in Section 2, population-wide screening for high blood pressure and high-risk screening for diabetes and dyslipidaemia has been recommended. There are several justifications for

recommending the population screening approach for high blood pressure as it fulfils all the criteria stipulated in Section 2. Blood pressure screening is perceived by the public as well as the providers as meeting a recognized *clinical* need. The programme is unlikely to encounter powerful resistance of organized vested interests as, for example, a tobacco control programme would; since risk reduction at every level of elevated blood pressure (above 115 mm hg SBP) envisages *comprehensive CVD risk reduction* as the goal, reductions in the mean population level of blood pressure would also be a vehicle for dietary control, tobacco control, diabetes control and obesity control. Thus, it would open the door for effective multi-pronged community intervention for CVD control.[108]

All categories of healthcare providers can play a part in population screening for high blood pressure. Lady Health Workers who are not formally trained to measure blood pressure can advocate for blood pressure checks; non-physician healthcare providers trained to check blood pressure can play a part in screening, recommending lifestyle modifications and referring for further management while physicians play the central role in screening, risk assessment and management.

In order to upscale population screening for high blood pressure in the country, awareness needs to be created among various categories of healthcare providers regarding the need and effectiveness of screening. Scientific principles of blood pressure measurement also need to be promoted. As screening is closely linked to risk assessment and management, a comprehensive training package needs to be introduced. Such a package needs to be scientifically valid, and introduced as part of an inherently sustainable CME programme. In addition, it needs to be resource-sensitive, practically feasible and rewarding for healthcare providers.

A recent demonstration project set up by Heartfile in the districts of Jhelum and Chakwal focuses on blood pressure screening as an entry point to addressing risks factors at a population level. In the Heartfile JC Project,[109] attention has been given to all elements critical to the development of training modules referred to above. These modules incorporate locally adapted versions of WHO CVD-Risk Management Package for low- and medium-resource settings",[110] which have been developed by the WHO CVD Unit. These use opportunistic screening for high blood pressure as an entry point to comprehensive CVD risk reduction. Risk assessment and management algorithms in this package have been validated in the native Pakistani setting, which makes them suited for inclusion as part of this programme. Algorithms in this package are meant to be implemented in a range of healthcare facilities in medium- and low-resource settings. For this reason, they have been designed for three scenarios that reflect the commonly encountered resource availability strata in such settings. The feasibility of up-scaling this model at a national level needs to be assessed.

Develop scientifically valid, resource-sensitive training programmes

3.3.4 Secondary prevention of CVDs

Patients who have suffered from a previous myocardial infarction or stroke are the highest risk group for further coronary and cerebral events. Evidence shows that with appropriate secondary prevention measures, mortality and morbidity can be significantly reduced in this group.[111-115]

Secondary prevention is also known to be cost-effective. To scale up secondary prevention practices, it is essential that appropriate investments be made in professional education, developing infrastructure for secondary prevention and creating awareness among those that have suffered an event. Secondary prevention of CVDs has received considerable attention in Pakistan owing to the efforts of several professional groups. These strategies have targeted affluent practices within busy cosmopolitan cities drawing on the support of physicians in tertiary and secondary care settings. However, such efforts have not been part of an inherently sustainable training programme. Moreover, they have largely been supported through commercial sources. There is, therefore, a need to build a concerted and sustainable secondary prevention programme based on an assessment of the currently prevailing trends in relation to secondary prevention. Such efforts must be evidence-based, resource-sensitive and scientifically valid. A significant step in this direction was the inclusion of Pakistan in the Prevention of REcurrences of Myocardial Infarction and StrokE (PREMISE) Study[116] – a WHO-coordinated international multi-centre collaborative study conducted by the CVD Unit, Geneva. This study aimed to assess prevailing patterns related to secondary prevention of coronary heart and cerebrovascular diseases in tertiary, secondary and primary healthcare settings in the developing countries.

Patients' access to appropriate and cost-effective drugs is limited in Pakistan

Preliminary results of the PREMISE Study show that patients' access to appropriate and cost-effective drugs is limited in Pakistan. Over 50% of the patients with CAD were not on aspirin, 40% were not on beta-blockers and over 80% were not receiving statin prescriptions. Over 60% beta-blockers, 70% ACE-I and 80% statins were obtained through out-of-pocket expenses; this was perceived as a barrier to ensuring compliance. Majority of the patients experienced difficulty in following risk-modifying advice, in particular dietary advice, because of cost considerations. Results also reveal that up to 20% of the patients continued to smoke despite their current condition. Moreover, up to 50% had not had their blood sugar or cholesterol levels checked in the past year.

Results of the PREMISE Study have several important implications for scaling up secondary prevention efforts in the country. These include improving skills essential for rational prescription of drugs and relaying risk modifying information to patients. Assessment of secondary prevention practices at the primary healthcare level also yielded important results, revealing that a majority of the patients who could access care and recognized the need for doing so visited tertiary health facilities when they had their first CAD or CVD event.

The PREMISE Study has identified the need for updating clinical practices for improving the quality of secondary prevention programmes within all healthcare and particularly primary care sites. A considerable amount of resources is channelled towards secondary prevention through commercial sources in Pakistan. There is a need to channel these resources in a structured manner to promote evidence-based sustainable training programmes that are scientifically valid. The role of the Ministry of Health in structuring this and bringing it within the framework of an inherently sustainable CME

programme in collaboration with professional societies is critical. Results also stress the need to improve access to appropriate cost-effective drugs. This has implications for ensuring sustained availability of drugs at all levels of healthcare.

As a follow-up to the PREMISE baseline survey, an intervention component entitled PREMISE 2 is in the pipeline for initiation. This aims to pilot test resource level-relevant training packages for different categories of healthcare providers with the overall objective of scaling up secondary prevention-related capacity in primary, secondary and tertiary care settings. The active role of all stakeholders such as the Ministry of Health, Heartfile and professional societies such as the Pakistan Cardiac Society and others, in this initiative will help to ensure its application beyond the pilot stage. Every effort should be made to link in with this initiative with a view to assessing the long-term feasibility of its application.

The PREMISE data reflect secondary prevention practices of healthcare providers within tertiary, secondary and primary healthcare settings; this represents the tip of the iceberg; there is no account of those with events who do not access healthcare facilities. The opportunity that exists to impact CVD mortality and morbidity by identifying this group and ensuring their access to healthcare needs to be emphasized.

PREMISE data give useful insights into secondary prevention practices

3.4 Preventive strategies: rheumatic fever and rheumatic heart disease

Rheumatic fever (RF) is a complication of an infection of the throat, which is caused by a bacterium. Once established and left untreated, it can damage various tissues in the body, the severest being valvular damage to the heart. Rheumatic fever is the major cardiovascular public health concern relating to children and adolescents in the developing countries – with poor housing conditions and overcrowding being major contributory factors. In Pakistan, a large cross-sectional survey conducted on more than 25,000 urban school going children in Lahore has estimated a prevalence of 22/1000 using echocardiographic parameters.[117] In rural areas, prevalence is reported lower at 5.7/1000.[118] Results from these surveys are not comparable due to variations in methodologies employed for estimating prevalence; however, findings from both the surveys are scientifically robust and generalizable. Earlier surveys reported low prevalence (0.6-2.3/1000) as samples were drawn from affluent urban populations;[119,120] their results were, therefore, not generalizable. Studies have also revealed that only 20% of the patients with RHD are aware of their condition; in addition only 8% of those with established RF in Pakistan are shown to be on RF prophylaxis.[118]

Fifty percent of those who have RF with carditis develop chronic valvular heart disease, which demands high-cost indoor hospital care. Data from NICVD show that 8-29% of the hospital admissions and 62% of the surgical load in tertiary care cardiovascular facilities can be attributable to RF/RHD.[121]

Rheumatic Fever and RHD can be prevented at two stages. Prompt recognition of sore throat and treatment with an appropriate antibiotic can deter the development of RF; this constitutes primary prevention. Once RF is

established, long-term antibiotic therapy is indicated as part of secondary prevention measures to prevent the occurrence of RHD, which can cause serious valvular damage to the heart and other tissues. Total coverage for primary prevention requiring treatment of every streptococcal sore throat is almost impossible even in affluent societies and in countries with manageable populations. However, intense secondary prophylaxis and primary prevention, wherever feasible, has proven to be reliable and cost-effective in developing countries.[122]

In Pakistan, a considerable amount of work has been done in relation to RF and RHD prevention in the last two decades. A review of this is critical since new initiatives must be built on previous efforts.

3.4.1 Background to RF/RHD prevention and control efforts in Pakistan[123]

Primary prevention, wherever feasible, and secondary prophylaxis of RF has proven to be reliable and cost-effective

As opposed to atherosclerotic CVD, Rheumatic heart diseases have been the focus of cardiovascular public health initiatives in Pakistan over the last two decades. The impetus for this stemmed from the WHO-organized International Seminar on Cardiovascular Diseases held in Tehran in 1972. Twenty-one countries from the Eastern Mediterranean Region (EMRO), inclusive of Pakistan, participated in this seminar. Based on its deliberations and earlier assessments, Pakistan was grouped into a cluster of countries, which were asked to prioritize RHD prevention and control within the broader framework of CVD prevention and control. Subsequently, WHO assisted with a range of activities aimed at capacity-building. In 1985, the WHO Global Programme for Prevention of RF/RHD was launched in 16 developing countries; this service-oriented activity needed to be implemented through primary healthcare and national healthcare delivery systems. Partial funding for this was arranged by the Arab Gulf Programme for United Nations Development Organization (AGFUND). As per stipulations of the Programme, the Ministry of Health appointed a National Programme Manager, who assisted with the development of a Multidisciplinary Advisory Committee and provided local inputs to developing a Plan of Operation.

The immediate objective of the Plan of Operation was to integrate RHD prevention with primary healthcare in a pilot setting. Case finding, registration, prophylaxis, health education, training and evaluation were part of the approach. The programme was planned in three phases. Focused on community approaches, Phase 1 or the pilot phase was structured to test the feasibility of the RF/RHD programme strategy in a selected area whereas Phase 2 was meant to be implemented in provinces. Islamabad was selected as the pilot site for this purpose; baseline assessments gathered epidemiological data;[v] in addition, several training sessions were held for health administrators and clinicians. [vi] The pilot experience enabled an assessment of operational details and helped define roles of the district and provincial administrative structures, schools and community activists in this loop. In 1994, a larger group meeting brought together provincial directors of health with a view to integrating this strategy with provincial health

[v] Pilot study in 1985 and prevalence survey in 1986-89.
[vi] Three-day training workshops held in 1988 and 1989.

mandates. Finally, in 1996, the RF/RHD prevention initiative was integrated with the Prime Minister's Programme for Primary Health Care.[vii] This provided an unprecedented opportunity to plug in RF/RHD with the work-plans of 50,000 LHWs and would have enabled access at the grassroots level. Initial efforts in this direction were positive; workshops were arranged at the provincial level and training materials were developed. In tandem, efforts were also made to ensure availability of oral and injectable penicillin at all levels of healthcare. Additionally, RF/RHD Registers were opened at cardiology departments of 18 medical colleges/teaching hospitals and several trainings were conducted in facility-based settings. However, for a public health strategy to succeed, it must first be modelled in a demonstration area and incorporate an evaluation protocol so that important elements may be refined and lessons learnt applied to a wider setting.

3.4.2 Approaches to prevention and control of RF/RHD

In view of the aforementioned considerations, future efforts aimed at RF/RHD prevention and control must be built upon previous efforts. Primary and secondary prevention can be achieved through four distinct measures that need to be instituted in tandem. Firstly, prevention of RF at the public health level cross-cuts with improving living conditions since RF is known to be a disease of poverty; clearly, this is outside the scope of the present discussion. However, with a stronger focus on poverty reduction measures, Pakistan is moving closer to achieving this objective. Secondly, health education interventions should incorporate awareness creating elements that promote early recognition of streptococcal sore throat and RF; such interventions should encourage parents to seek healthcare for possible symptoms that their children may have. Thirdly, the reorientation of health services strategy as part of the Action Plan must include guidance for healthcare providers at all levels; in this regard, clinical guidelines on RF/RHD need to be developed. Recently, the Pakistan Cardiac Society Council on Rheumatic Heart Diseases has initiated efforts to develop locally customized guidelines.[124] Such efforts need to be supported. The case for locally applicable guidelines is made even more compelling in Pakistan since this is a high prevalence region for RF; strict adherence to the Jones Criteria for diagnosis of RF may, therefore, result in under-diagnosis.[125]

In the fourth place, and in tandem with efforts aimed at professional education, the availability of penicillin should be ensured at all healthcare levels. Results of a recently conducted cross-sectional survey have revealed that penicillin is usually not available at basic healthcare sites.[126] Penicillin is a cost-effective drug for secondary prevention of RHD. Follow-up of treatment can be done by trained paramedical staff. This is, therefore, a feasible intervention even in basic health sites. Every effort should be made to promote its use in appropriate settings.

This section has reviewed current epidemiological data on cardiovascular diseases and the existing on ground programmes relating to their prevention, control and health promotion outlining their strengths and weaknesses. Based on this information, a strategy has been devised to guide future efforts aimed

[vii] Currently known as the National Programme for Family Planning and Primary Health Care.

at CVD prevention, control and health promotion in Pakistan. The Action Agenda items as part of this strategy have been listed below. However, as part of the **Integrated Framework for Action**, CVD has been grouped alongside other NCDs in an integrated model which combines a range of interventions and actions across other NCD domains.

3.5 Cardiovascular Diseases - Action Agenda

- Integrate surveillance of cardiovascular risk factors with a population-based NCD surveillance system; develop and validate tools of assessment for the Pakistani population. Integrate public health programme monitoring and evaluation with NCD surveillance.✝
- Promote physical activity and a healthy diet as a cultural norm as part of the NCD behavioural change communication strategy. Create awareness about the risks of CVD and its mitigates, prevention of RF and RHD and screening approaches.✝
- Promote strategies for mitigation of cardiovascular risks through population-level approaches.✝
- Revisit health policy on diet and nutrition to expand its current focus on under-nutrition.✝
- Develop a nutrition and physical activity policy seeking guidance from the WHO Global Strategy on Diet and Physical Activity.✝
- Develop policies and strategies to limit the production of, and access to, *ghee* as a medium for cooking.
- Develop agricultural and fiscal policies that increase the demand for, and make healthy food more accessible.
- Create an enabling physical and social environment for physical activity.✝
- Generate support from religious leaders to endorse the need for participation of women in physical activity. ✝
- Enforce effective legislation to stipulate standards for urban planning.
- Utilize available open spaces for physical activity where feasible and appropriate.
- Integrate concerted primary and secondary prevention programmes into health services as part of a comprehensive and sustainable, scientifically valid, culturally appropriate and resource-sensitive CME programme for all categories of healthcare providers.
- Promote screening for raised blood pressure at the population level. Promote high-risk screening for dyslipidaemia and diabetes in high-risk groups only.
- Focus attention on improving the quality of prevention programmes within primary and basic health sites.
- Ensure availability of aspirin, beta blockers, thiazides, ACE inhibitors, statins and penicillin at all levels of healthcare.
- Conduct clinical end-point trials in the native Pakistani setting to define cost-effective therapeutic strategies for primary and secondary prevention of CVDs.
- Build capacity of health systems in support of CVD prevention and control.✝
- Build a coalition or network of organizations at the national, provincial and local levels facilitated by federal and provincial health services to add momentum to CVD prevention and control as part of a comprehensive NCD prevention effort.

✝ **Priority Action Areas**
Priorities within other Action Areas will be determined subsequently

4

Diabetes

4.1 Context

Diabetes is a growing global health concern. The worldwide prevalence of diabetes in the adult population over 20 years of age, reported at 4% in 1995 with an estimated 135 million people affected, is expected to rise to 300 million by the year 2025; 75% of these people will hail from the developing countries.[127]

Pakistanis are an ethnic group having an inherent predilection to develop diabetes; [128] increase in life expectancy and major changes in diet and lifestyles that are a part of urbanization and social development further contribute to the existing trend.[129] Undiagnosed, untreated and poorly controlled diabetes is known to exhort a considerable toll on individuals, communities and the healthcare system. It significantly adds to the burden of preventable diseases and leads to economic losses that stem from high cost of care and lost productivity. On the other hand, scientific evidence highlights the potential to prevent diabetes and its complications through cost-effective measures at the population and high-risk levels of intervention. [130,131]

Diabetes manifests at a younger age in Pakistan

4.2 Data on diabetes in Pakistan

South Asian expatriates living in the western world – particularly in the United Kingdom and USA – are known to have higher prevalence of diabetes and the metabolic syndrome compared with native and other resident populations.[132] In a recently conducted survey in the UK, the age standardized (35-79 years) prevalence of diabetes in a Pakistani population was reported at 33% compared with 20% in Europeans and 22% in the Afro-Caribbean population.[128] High prevalence of diabetes in expatriate Pakistanis cannot entirely be attributed to migration as surveys conducted on the native settings have yielded similar results.

Conducted in the mid-90s, the National Diabetes Survey of Pakistan was a phased nationwide prevalence study of diabetes; this survey documented prevalence of diabetes and Impaired Glucose Tolerance (IGT) in four provinces (NWFP, Balochistan and Sindh) utilizing similar study protocols and standardized WHO definitions for the diagnosis of IGT and diabetes. Even though overall glucose intolerance (diabetes and IGT combined) was present in 22-25% of the subjects examined, some differences were observed across provinces. In the urban areas, overall prevalence of diabetes ranged from 10.8 % in Balochistan to 16.5% in Sindh, whereas in the rural areas, prevalence ranged from 13.9% in Sindh, 7.5% in Balochistan to 6.39% in

Punjab. The overall prevalence of IGT in these surveys ranged from 5.39% to 11.2%.[6,134-135]

More than 36% of the diabetics are unaware of their condition

A higher prevalence of obesity and IGT was observed among women compared with men in all surveys, indicating that diabetes has not yet manifested to its full extent in women, who can thus be seen as a potential target group for primary prevention. Moreover, it is a matter of grave concern that both diabetes and IGT are manifesting at a much younger age group (35-44 years) in our population compared with western populations. Nearly one-third to one-half of the subjects in these surveys had undiagnosed diabetes.

In all these studies, data revealed associations between diabetes prevalence and age, obesity, central obesity and a positive family history of diabetes. The association of central obesity was greater for women compared with men. These results were among the first in Pakistan to document that diabetes and glucose intolerance could no longer be regarded as a problem confined to migrant communities; published data from these surveys played an important part in creating awareness about the magnitude of the issue. However, it should be recognized that the available prevalence data is based on the old WHO diagnostic criteria and that the prevalence of diabetes would actually be higher if the new criteria are adopted.

Table 4.1 Diabetes and impaired glucose tolerance in Pakistan: regional prevalence data from DAP-WHO Surveys (1994-1998)[6,134-135]**

Province	Diabetes (%)?	IGT (%)?
Sindh (Rural)	13.9	11.2
Sindh (Urban)	16.5	10.4
Balochistan (Rural)	7.5	7.4
Balochistan (Urban)	10.8	10.4
NWFP (Rural)	12.0	9.4
Punjab (Rural)	6.39	5.39
Punjab (Urban)	13.23	11.54
Overall prevalence	11.47	9.39

** Age 25 years and above

? Defined as a fasting glucose of = 140 mg/dl or 2 hour post 75 g glucose load = 200 mg/dl

? Defined as a 2 hour post 75 g glucose load = 140 mg/dl and = 199 mg/dl

Less than 3% of the diabetics have their condition in control

Against the backdrop of the high prevalence of diabetes and IGT in Pakistan, the NHSP reported a very high unawareness rate for diabetes, with 36.3% of the diabetics being unaware of their condition. The survey also reported one of the lowest control rates for diabetes in the world; less than 3% of the diabetics had their condition in control.[viii] Recently conducted surveys have revealed that knowledge relating to diabetes and its prevention is significantly low even in the urban metropolitan areas; only 40% of the known diabetics treated at tertiary healthcare facilities in Karachi had correct knowledge relating to diabetes and its complications.[136] In urban Quetta, only 33% of the diabetics were aware of essential information relating to diabetes and its

[viii] Control was defined as having a random blood sugar of = 140 mg/dl among those taking medication for diabetes

complications.[137] With these trends, it can be assumed that both the control and awareness rates would be much lower in the underprivileged rural areas.

Data from the aforementioned surveys serve two purposes; firstly, they serve as an entry point and a valid baseline to build the diabetes component of the NCD surveillance system. Secondly, they provide valid scientific evidence relating to the burden of diabetes in Pakistan. Since the data are representative of the general population, they provide sufficient information to initiate public health action for the prevention and control of diabetes. However, it is important to gather information on diabetes on an ongoing basis and in that context, essential to include diabetes in the population-based NCD surveillance system. Inclusion of diabetes in the surveillance process entails adding information obtained from blood samples. This approach in Pakistan's context may not be feasible in the short term because of resource constraints. As an alternative, the physical measurement of waist circumference can be used as a proxy for the risk of diabetes. In a recently conducted case-control study on patients with angiographically defined CAD versus controls with no evidence of disease, waist circumference was strongly associated with the risk of developing CAD and diabetes.[69] However, future efforts in upgrading the surveillance system should be structured to allow a more comprehensive assessment, expanding this approach to include laboratory assessments.

Diabetes has one of the strongest causal associations with CAD in the Pakistani population

From a diabetes-related epidemiological standpoint, future research efforts should also be aimed at identifying novel causal associations which could be potential targets for preventative interventions.

4.3 Prevention and control of diabetes

Diabetes prevention and control is particularly relevant in Pakistan; increased inherent predisposition, younger age of onset, lack of capacity to effectively treat the condition at the primary healthcare level and lack of equitable access to healthcare for possible complications makes a strong case for investment in diabetes prevention and control. Diabetes is also one of the strongest causal risk factors for CAD in the Pakistani population. [69] In addition, facility-based data have revealed that the complication rate in diabetes is very high in Pakistan owing to factors mentioned above. Complications are known to increase with age, duration of diabetes and severity of uncontrolled diabetes. In an urban facility-based setting in Pakistan, 19.8% of the diabetics were shown to be suffering from CAD, 6.2% had suffered a major cerebrovascular event whereas 2.1% had a diabetic foot.[138] Another study has revealed that 25% of those that present to healthcare facilities in Pakistan with diabetes suffer from retinal complications.[139] High complication rate indicates that the economic costs of care at a health systems level and the costs related to lost productivity are significant in this economically challenged environment. Furthermore, a recent study on persons with type 2 diabetes has shown that a large number of patients with macrovascular complications have modifiable risk factors.[140] There is, therefore, a need to step up comprehensive efforts aimed at prevention and control.

Prevention and control of diabetes needs to be structured at all levels of prevention – primary and secondary. Evidence suggests that there is a clear potential in reducing diabetes-related mortality and morbidity by addressing

risks, both at the primary and secondary prevention levels. Any attempt aimed at reducing diabetes-related morbidity and mortality should ideally encompass prevention and treatment of diabetes and its complications and rehabilitation. The Action Plan focuses on primary and secondary prevention; however, issues that relate to treatment and rehabilitation are outside the scope of this initiative. Future efforts that further build on this initiative must take this into account.

4.3.1 Approaches to prevention of diabetes

Strategies for preventing diabetes fall within the primary and secondary prevention domains and can be grouped into population and high-risk approaches. The population approach focuses on mitigating risks whereas the high-risk approach involves intensified case-finding in high-risk groups and provision of guidance to patients relating to risk reduction and effective control.

4.3.1.a Population approach: the population approach to prevention of diabetes is aimed at modifying the levels of causal risk factors in populations or groups of individuals, without regard to the specific level of risk of the individual. As opposed to non-modifiable risks, inclusive of genetic susceptibility, ethnicity and increasing age, there are a range of modifiable risk factors for diabetes which can be effectively addressed through population measures. These include obesity, physical inactivity, unhealthy diet (high saturated fat, low fibre, high glycaemic load) and smoking. A combination of risk factors further increases the risk of diabetes whereas reducing modifiable risks can delay or prevent its onset. Addressing these risks, both in the primary and secondary prevention settings, is the cornerstone of the population approach to prevention of diabetes. These risks have been discussed in detail in Sections 3 and 5. The approaches to addressing these risks have been discussed as part of the behavioural change communication strategy, community and media interventions and school health strategy in Section 2. Young people of all ages need to be targeted to keep their risks at low levels. School health initiatives, therefore, provide an opportunity to identify obese and overweight children.

4.3.1.b High-risk approach: the high-risk approach to the prevention and control of diabetes focuses on addressing risks and intensified case-finding in high-risk groups, management and patient education.

With an overall population prevalence of 10% over the age of 25, a case could have theoretically been made for population screening for diabetes. However, the relatively higher costs involved in the screening procedure, paucity of screening infrastructure at basic healthcare levels and limited capacity of healthcare providers has necessitated a more selective approach.

All patients with symptoms of hyperglycaemia, those with a family history of diabetes and a previous history of CVD and those who are overweight and obese are at high risk and must be tested for diabetes. All patients with established hypertension and dyslipidaemia must also be tested for diabetes as the treatment targets are lower in cases of diagnosed diabetes. Women with gestational diabetes and those who have given birth to large babies are also at high risk and must be tested for diabetes as indicated.[141] People with

Non-physician healthcare providers can be taught to screen those at high risk of developing diabetes

impaired glucose tolerance/impaired fasting glucose are predisposed to subsequent development of diabetes and suffer the highest risk in this respect.

Although there are no data from diabetes intervention trials in the native Pakistani setting, a number of studies conducted on western populations have shown that with lifestyle interventions, it is possible to delay or prevent diabetes in the high-risk population. Diet and/or exercise are known to have led to a significant decrease in the incidence of diabetes amongst those with IGT and delay the progression from IGT to diabetes.[142,143] Data from more recently conducted randomized clinical trials, also including those at increased risk of developing diabetes by virtue of being overweight and having a family history, show that lifestyle interventions could reduce the risk of diabetes by 58% in the high-risk group.[131] Moreover, this study showed that lifestyle changes were more effective compared with drug treatment. The ongoing Indian Diabetes Prevention Programme is currently involved in evaluating the efficacy of lifestyle modifications and drugs as a means of primary prevention in a population with similar environmental conditions and genetic propensity as the Pakistani population.[144] Results of the study are likely to yield useful lessons for the Pakistani setting.

Intensified case finding in high-risk groups must involve the recognition of those at high risk and the settings in which they can be identified. Awareness must be created as part of community intervention strategies about the need for high-risk groups to be tested for diabetes. However, the major focus should be on healthcare providers who play a major role in risk factor counselling, intensified case finding and risk assessment and management. A recent survey assessing knowledge, practices and attitudes of family physicians has shown that there are several gaps in their understanding and consequently their practices with regard to screening and management of diabetes.[145]

Prevention of diabetes should, therefore, be an integral component of the structured NCD training programme discussed in Section 2. This should be aimed at stepping up the knowledge level, skills and capacity to screen and assess those at the risk of developing diabetes, and managing those at high-risk and with established diabetes. Appropriate interventions must be developed for all categories of healthcare providers. Lady Health Workers, non-physician healthcare providers and physicians are all important in this loop. The non-physician category of healthcare providers can be taught to identify and screen those at high risk of developing diabetes and refer them for further workup and management. Physicians can be trained to include risk assessment and management of diabetes as part of their routine work-plan in a simplified manner. This implies that guidance on intensified case finding in high-risk groups and simplified customized algorithms on management of diabetes should be included in NCD training packages for all categories of healthcare providers, as appropriate. This concept has previously been highlighted as a common Action Area in Section 2. Healthcare providers in the reproductive health systems must also be part of the loop so as to facilitate screening of high-risk women.

Guidance on prevention of diabetes as part of NCD training packages needs to be locally relevant to the Pakistani population. Evidence points to the need

Evidence highlights the need to have population-specific targets for prevention in the Pakistani setting

to have population-specific targets for prevention in the Pakistani setting. There are many indications that in south Asians, the risk of diabetes starts to increase rapidly at levels of BMI or waist circumference well in the acceptable range for Europeans, implying that cut-off points as recommended for European White populations have little value in identifying Asian individuals at high risk.[146] Emerging data from the INTERHEART study also show that in south Asians, increases in BMI from 22 to a range of 23 to 25 are associated with a 30% increase in CVD.[147] Based on these considerations, lower BMI cut-off points need to be recommended. Similarly, cut-off values for waist circumference also need to be lowered. The World Health Organization recommends a limit for waist circumference of 102 cm and 88 cm in men and women, respectively; however more appropriate waist circumference action levels are now being sought to specify risk levels relating to diabetes in Asian countries. This is being done to alert those with lower BMIs to their increased risk. A recent study from India attempted to find out the normal cut-off values for BMI and upper-body adiposity by computing their risk associations with diabetes. The study has defined a BMI of 23 kg/m^2 as normal for both men and women; cut-off values for waist circumference were 85 cm for men and 80 cm for women; for waist-hip-ratio they were 0.89 for men and 0.81 for women.[148] China has adopted its own standards defining abdominal obesity by a waist circumference of 85 cm in men and 80 cm in women and recommendations have also been made to lower cut-off points for Pakistanis. Based on these, the upper limit has been defined as 91.5 cm in men and 84 cm in women.[37] However, this needs to be validated by longitudinal data sources. Based on this information, it will be possible to develop region-specific risk scores for the Pakistani setting.

Patient education is one of the critical elements of the high-risk approach to diabetes. This needs to be part of the NCD training packages for all categories of healthcare providers. There is also a need for concerted efforts to involve the patient and the family in the process as this will enhance the chances of success.

4.3.2 Diabetes prevention and control-related efforts in Pakistan:

The first National Action Plan on Diabetes (1996-98) was conceptualized in 1995, based on the conclusions of the National Workshop on Diabetes Control held in Islamabad in November 1995.[149] The need for developing the Diabetes Plan was evidence-based since it was preceded by an epidemiological survey, which highlighted the magnitude of the disease burden; details have been discussed in the section on epidemiology. The first Diabetes Plan issued recommendations for developing a primary prevention programme for diabetes and stressed on the need to improve management of individuals with diabetes. The recommendations were based on scientifically valid principles. Many of these, such as integration of diabetes with other NCDs and with primary healthcare, the need to step up data collection efforts, health education, training of healthcare providers, development of customized tools as a priority and identification of high-risk groups through integrated mechanisms such as in the case of gestational diabetes, have been further built upon in this Action Plan. Various guidelines and patient guidance materials that were developed as part of this initiative will prove useful in the

present context while developing the diabetes component of the NCD training packages. The Diabetes Plan also made strong recommendations for the Ministry of Health to identify an effective mechanism to ensure that it assumes its role as initiator and coordinator of diabetes prevention-related activities with active inputs of private sector stakeholders and spelt out the need for appointment of a focal point for NCDs in this connection.

The second Diabetes Plan updated objectives and strategies, reviewed progress in terms of activities and proposed further initiatives for the period 1999-2001.[150] The revision was prepared on the basis of discussions held in Karachi in March 1999. In addition to further strengthening the recommendations of the first Diabetes Plan, the second version made specific recommendations to adopt the WHO standards of care. The Diabetes Plans were successful in developing clinical guidelines for the management of diabetes and in securing a changeover to a unified strength of insulin.

However, for a Plan of Action to succeed, it must first be modelled in a demonstration area and incorporate an evaluation protocol so that important elements may be refined and lessons learnt applied to a wider setting. The Diabetes Plans packaged morbidity-related outcome measures projected over a long term without a clear definition of short- to medium-term processes and outputs level measures. As part of this Action Plan, an attempt has been made to bridge these gaps. Moreover, diabetes prevention has been integrated with other NCDs; the Integrated Framework for Action highlights this approach. The Action Agenda specific to diabetes is summarized below.

4.4 Diabetes - Action Agenda

- ✍ Integrate surveillance of diabetes with a comprehensive population-based NCD surveillance system. Use waist circumference as a proxy indicator for the risk of diabetes in the short term. However, as part of future efforts, upgrade surveillance to allow a more comprehensive assessment incorporating biochemical assessments. Build on previous data collection efforts. Integrate public health programme monitoring and evaluation with NCD surveillance.✝
- ✍ Integrate prevention of diabetes as part of the comprehensive behavioural change communication strategy (refer to Action Agenda in cardiovascular diseases and tobacco sections).✝
- ✍ Build capacity of health systems in support of prevention and control of diabetes.✝
- ✍ Integrate prevention of diabetes and intensified case finding in high-risk groups into health services as part of a comprehensive and sustainable, scientifically valid, culturally appropriate and resource-sensitive CME programme for all categories of healthcare providers.
- ✍ Ensure availability of anti-diabetics (insulin, sulphonylureas, metformin) at all levels of healthcare.
- ✍ Seek guidance from and build on previous scientifically valid efforts in Pakistan related to prevention and control of diabetes.
- ✍ Build a coalition or network of organizations at the national, provincial and local levels facilitated by federal and provincial health services to add momentum to diabetes prevention and control as part of a comprehensive NCD prevention effort.

✝ **Priority Action Areas**
Priorities within other Action Areas will be determined subsequently

5

Tobacco

5.1 Context

The annual death toll attributable to tobacco is expected to rise from its current estimates of 5 million per year to 10 million by the year 2025. Parallel to this trend, there are also projections for a shift in the disease burden from its current split between the developed and the developing countries to a scenario where 70% of these deaths will occur in the developing countries by the year 2025.[151] However, the devastation caused by tobacco goes much beyond this picture with implications for individuals, societies and health systems.

Reliance on revenue generated from tobacco is a barrier to effective tobacco control

Clearly, tobacco is an enormous public health challenge. Its use appears to be a matter of a simple individual choice; however, the dynamics influencing this choice are linked to economic factors and are embedded in a complex interplay of several policy and environment parameters with implications for growers, transporters, traders, advertisers, public authorities, the health sector and the tobacco industry. Consequently, the control of tobacco use has to be a combination of measures that integrate public health interventions to alter individual behaviours with the objective of reducing demand on the one hand. On the other hand, such measures should focus on interventions to alter the legal, social, fiscal, economic and physical environment.

The tobacco industry puts forward the argument that it runs a *legitimate* business; markets and sells a *legal* product and has the *constitutional right* to communicate with their consumers. This highlights the need for generating a dialogue on fundamental issues at the global level. The development of an international strategy on the future of product modification should be part of this approach.

Reliance on revenue generated from tobacco is one of the fundamental barriers to effective tobacco control in Pakistan. This will continue to remain a hurdle, undermining any strategy that aims to address tobacco control in a comprehensive manner. The government relies heavily on revenue generated from tobacco. In the year 2000, tax revenues from cigarettes totalled Pak Rs. 19.8 billion (including Pak Rs. 18.5 billion in excise and sales tax); this represented approximately 25% of all excise revenue and more than 6% of all taxes collected in the country for that year.[152,153] Against this backdrop, there are no data available on the social costs of tobacco compared with revenues earned. Clearly, this highlights a public health challenge of a significant magnitude and places the onus of responsibility on the government to institute measures to seek alternative means of revenue generation.

More than 40% men and 12.5% women use tobacco in one form or the other

The tobacco issue has a larger international context; liberalization of international trade makes the developing countries a natural market for tobacco. Within this context, it became increasingly clear that the absence of a global set of binding rules would jeopardize regulatory efforts within countries. The World Health Organization responded to this challenge by taking a lead in developing the Framework Convention on Tobacco Control (FCTC) by exercising its constitutional right (Article 21) to negotiate a set of globally-binding rules.[154] The FCTC is aimed at building an international regulatory framework, which will assist and support countries in national regulatory policies within the framework of tobacco control. Unanimously adopted by all the 192 member states of WHO, including Pakistan, at the 56th session of the World Health Assembly in May 2003, the FCTC needs to be officially adopted and ratified by 40 countries that wish to integrate the protocols stipulated in this treaty into their tobacco control legislative frameworks, before it comes into force globally.

The Framework Convention on Tobacco Control (FCTC) marks a watershed in global tobacco control. The FCTC includes the most effective measures known to reduce the incidence of tobacco use including higher taxes, smoke-free areas and bans on advertising. But turning the promise of the FCTC into concrete legislative and regulatory gains will require that policymakers and advocates understand and take a holistic approach to the issue. The Action Plan revolves around the different provisions of the FCTC and can form a baseline for the process of ratification of FCTC in Pakistan. Some of the issues earmarked in the Action Plan such as those requiring further research and understanding can be achieved in collaboration with the global community. This cooperation is ensured under FCTC and countries that ratify FCTC can look forward to benefiting from and sharing of research and knowledge in this respect.

One of the major areas where Pakistan can benefit from FCTC ratification is the issue of tobacco growing, especially in small land holdings which were dedicated to growing food previously. Being a tobacco growing country, Pakistan would require sharing of experiences from other countries for the diversification of crops and finding suitable alternatives for tobacco growers. FCTC encourages governments to promote, as appropriate, economically viable alternatives for tobacco growers in cooperation with each other, and with competent international and regional intergovernmental organizations. Other cross-border issues related to tobacco control like illicit trade, advertising through internet and opening of trade barriers to cheaper foreign brands which form a part of global cooperation for tobacco control, are all tackled under FCTC.

5.2 Data on tobacco use in Pakistan

The National Health Survey of Pakistan showed that tobacco use was common in Pakistan, with 54% men and 20% women using tobacco in one form or the other; prevalence of smoking increased with age among both males and females. Men in the age range of 25-44 years had the highest prevalence of smoking (cigarettes and *beedis*) whereas in the case of women, prevalence was highest between the ages of 45-64 years. On the other hand, *huqqa* and chewing tobacco was commonest among men and women aged 65

years and above. According to this survey, smoking was commoner in rural compared with urban areas and among the illiterate as opposed to the literate population.[5] A recently conducted survey reported a higher prevalence among the illiterate (41.2%);[7] however, lack of comparability between this and earlier surveys obviates the possibility of comparing results.

A recent cross-sectional survey on a random sample of 632 urban school-going children in Islamabad carried out by The Network for Consumer Protection has revealed that 28% of the urban adolescents between the ages of 15-18 years currently smoke. Of these, 75% are regular smokers and 58% have been smoking for the last two years; 92% of those who smoke were aware of the hazards of smoking and 78% had even tried to give up. Peer pressure was reported as the predominant cause for initiating smoking, with 76% of the smokers in this survey referring to it. In the remainder, portrayal of style through advertising was outlined as the initiating factor.[155]

A recent surveillance effort introduced in Pakistan is the Global Youth Tobacco Survey (GYTS). Focusing on adolescents aged 13-15 years, this school-based survey provides an insight into students' knowledge, attitudes, and behaviours as these relate to tobacco, inclusive of issues pertaining to access and availability, exposure to passive smoke, tobacco use cessation, media advertising, and school curricula.

Results of the survey demonstrate that cigarettes are used far less often than other tobacco products. For example, in Islamabad, while only 1.7% of the students (2.5% boys and 0.5% girls) reported use of cigarettes in the last month, 10.3% of the students (11% boys and 8% girls) reported use of other tobacco products. These results also demonstrate relatively high exposure to passive smoke; in Islamabad, almost three in 10 students live in homes where others smoke in their presence, and almost four in 10 are exposed in places outside their home. More than nine in 10 students thought that smoking should be banned in public places. Just over half the students (57.3% in Islamabad and 55.8% in Lahore) reported being taught in school in the past year about the dangers of smoking. One encouraging finding was that although eight in 10 students reported seeing cigarette advertisements in the previous month, about eight in 10 also reported seeing anti-smoking media messages. Finally, a significant proportion of students reported being offered free cigarettes by tobacco company representatives (22.8% in Lahore and 18.5% in Islamabad). These results can be used to guide the development of programmes and policy, and to monitor the implementation of such policies along provisions of the FCTC.[156]

Eight in 10 students reported seeing anti-smoking media messages

The need to establish surveillance mechanisms that track NCD risk factors over time has been clearly laid out in Section 2; such systems will make it possible to track changes over time in smoking trends. Surveillance of tobacco use must, therefore, be integrated with a population-based NCD surveillance system.

Tobacco use is known to have a strong causal association with a number of diseases in western populations;[157] association of tobacco use with diseases has also been demonstrated in the native Pakistani setting. Association of current, past and passive smoking has been documented with

angiographically defined CAD in a recently reported case-control study from Pakistan.[69]

Associations have also been demonstrated between tobacco use and cancer in Pakistan. A case-control study of biopsy proven carcinoma of the oral cavity and oro-pharynx and age and sex matched controls has revealed that the risk of developing cancer when *pan* was used was 4.2 and 3.2 times higher in males and females respectively, compared with controls; when both *pan* and tobacco was chewed, the risk increased six times for females and nine times for females whereas the combination of *pan*, chewing tobacco and smoking caused the risk to increase 23 times for males and 35.9 times for females.[158] The demonstration of significant causal associations in the native Pakistani setting makes a very strong case for addressing tobacco as a risk factor at all levels of prevention within the country. Furthermore, a strong causal association has also been demonstrated between tobacco use and tuberculosis in India.[159,160] This may well be the case in Pakistan and needs to be further explored in our setting.

5.3 Tobacco production in Pakistan

According to estimates for the year 2002, Pakistan produces 62.3 billion sticks annually. However, officially reported data on cigarette production are usually an under-estimation as these do not include cigarettes that are smuggled, counterfeited and produced by the tax-evaded sector. Furthermore, these data do not take into account, the non-cigarette tobacco products traditionally used in Pakistan such as *beedis*, handmade sticks, and various forms of chewed tobacco such as, *patti* and *qivam*. Currently, 24 tobacco manufacturers operate in Pakistan; two of the largest account for 40-50% of the total cigarette production and have 98% of the market share.[161] Financial highlights of tobacco companies over the last five years indicate a great boom in their businesses, this being an indirect evidence of the rising magnitude of tobacco consumption in Pakistan.[162]

5.4 Tobacco control strategies

There are a range of policy and environmental strategies that are known to reduce tobacco consumption; these involve regulating access and limiting demand through restrictions of advertising, marketing, promotion and through price and taxation. There is evidence in the western world that comprehensive tobacco control programmes are most effective when they also have community programmes including school programmes, enforcement of tobacco control policies, cessation programmes, mass media counter-marketing campaigns for both prevention and cessation, and surveillance and evaluation of efforts.[163] Smoking bans are also effective in reducing exposure to passive smoking, as well as reducing consumption and cessation.[164] These strategies have been discussed with regard to their relevance in the Pakistani setting. Efforts aimed at tobacco control within these domains must, however, be paralleled with efforts to mitigate reliance on revenues generated from tobacco on the one hand, and must ensure alternative means of livelihood for those dependent on the tobacco trade, on the other.

5.4.1 Restricting youth's access to tobacco

Most smokers begin smoking in their teenage and continue to smoke throughout their lives. Early starters are known to develop a stronger physical addiction, which makes it more difficult to quit.[165] This has important implications for prioritizing efforts to restrict youth's access to tobacco.

Pakistan's history of legislative measures to restrict the access of youth to tobacco dates back to 1918, with the state of Bahawalpur adopting the Juvenile Smoking Act; a similar act was subsequently passed by NWFP and Punjab prohibiting sale to minors. In 1959, the West Pakistan Juvenile Smoking Ordinance was adopted by the government, repealing other Acts. This Ordinance, in effect until 2002, was replaced by the Prohibition of Smoking Ordinance 2002, imposing a ban on sale to minors.[166] As part of this, both minors that attempt to buy cigarettes and sellers can be held accountable for their actions. However, there are issues with the implementation of this Ordinance due to considerations relevant to developing country settings; these include the issue of *sale to minors* and *sale by minors.*

The trend of child labour in Pakistan has forced many children into becoming vendors; sale of cigarettes is a very profitable commodity in that respect. It is, therefore, extremely difficult to implement such legislative measures when their enforcement is dependent on a range of factors rooted in other social issues. In spite of being anecdotally aware of such practices, hardly has a case ever been reported where a minor has been booked for sale or purchase of tobacco products and clearly, there is no baseline data to guide further action in this regard. It is, therefore, a priority to look into the determinants of these behaviours and to study strategies that could potentially mitigate such trends.

As part of the stipulations of the Prohibition of Smoking Ordinance, 2000 schools have also been declared smoke-free in Pakistan. Experiences from developed countries show that a school smoking ban, combined with other smoking prevention and education efforts, is associated with decreased levels of smoking in adolescents.[167] There are isolated examples of the integration of smoking cessation with school health initiatives in Pakistan. These initiatives utilize behavioural change strategies to influence knowledge and practices.[168,169]

The trend of child labour in Pakistan has forced many children into becoming vendors

However, there is a need to include tobacco-related health education in a comprehensive school health programme. This would require active support and involvement of the Ministry of Education and will have to be taken up as a policy decision, with implications for educational institutions both in the public and private sectors. It is essential to get all those involved in piloting school health experiences together to devise a comprehensive school health strategy, of which, tobacco cessation would be a part. Active commitment and involvement of the ministries of Health and Education and regulating bodies of private sector schools, the civil society and textbook professionals that design school curricula would be essential to this exercise.

The development of school and college curricula and school-based prevention programmes is more effective if accompanied by community-wide tobacco control programmes that involve parents, mass media, community

organizations and other elements in the adolescent's social environment.[170] These have been discussed elsewhere in this chapter.

5.4.2 Clean air policies

The promotion of clean air policies is one of the most effective public health measures. This can be enforced in different settings: public buildings, schools, restaurants, and private worksites. In the last decade, recognition of the harmful effects of passive smoking has lent an added impetus to such efforts, as a result of which many countries in the world have set into place, effective legislative measures to ban smoking in public places.

In Pakistan, the Prohibition of Smoking Ordinance 2002, which bans tobacco use in all public places, transport and indoor workplaces, was promulgated after a time lapse of four decades since the earlier enactment of the 1959 Ordinance. This Ordinance came into effect on the 30th of June, 2003. If enforced in its true spirit, this legislative measure has the potential to reduce tobacco consumption to some extent and decrease exposure to second-hand smoke in public places.

The promulgation of this Ordinance gives the Ministry of Health the mandate to ensure its enforcement, wherever applicable. The Ministry has since taken a number of tangible steps aimed at enforcing this Ordinance; as an initial step, an implementation committee has been set up with broad-based representation; based upon the recommendations of this committee, several steps have been taken to-date. These include issuance of official orders and dissemination of the Ordinance to all institutes within the federal, provincial and private sector domains; information and transport-related institutions inclusive of the Pakistan International Airlines (PIA) and the Pakistan Railways and local governments. In addition, several conferences and seminars have been conducted with broad-based representation to create awareness among the professional society and to orient the media to this concept.[ix] These efforts have been backed by print and electronic media interventions and give-away materials to create awareness about various sections of the Ordinance.[x]

The successful enforcement of this Ordinance is a multidimensional issue with implications for those enforcing it and those abiding by it. A comprehensive strategy with clear guidelines will have to be developed for this purpose. Possible lack of commitment on part of decision makers in the long term; lack of awareness about specific aspects related to its enforcement and lack of clarity relating to the mandate of the responsible officers in charge of enforcing the Ordinance, are barriers to its successful enforcement. Most importantly, the absence of resources and lack of capacity and

[ix] Advocacy Conference on 'Implementation of Prohibition of Smoking and Protection of Non-Smokers Health' held on April 27, 2003; World No Tobacco Day observed on May 31, 2003; Two press conferences organized by the Ministry of Health to coincide with the launch of the Ordinance; Six WHO-assisted provincial workshops on the Ordinance held with media representatives in Lahore, Karachi, Quetta, Peshawar and Muzaffarabad and Islamabad; Five WHO-assisted 'Alliance building Workshops with NGOs' held at Bahawalpur, Quetta, Karachi, Islamabad and Peshawar; Inter-Provincial Health Ministers' and Secretaries' Conference held on July 30-31, 2003.

[x] With the inscription: 'Smoking is prohibited by law and it is a punishable offence'.

commitment are also perceived as barriers. There is, therefore, the need to periodically assess the quality and degree of implementation of tobacco control measures as stipulated in the Ordinance.

The effective enforcement of the Ordinance also requires active support of the professional community and scientific forums; endorsement of professional societies must be actively sought and their potential harnessed in this initiative. Public support and commitment needs to be generated in order to support its enforcement within a variety of environments.

Clean indoor air policies also need to be actively supported in the working environment. A smoking cessation programme, combined with a clearly publicised smoking policy and heath education campaign that discourages tobacco use, is one of the most cost-effective strategies for tobacco control in worksites.[171] Worksites are also excellent mediums for such efforts because of the availability of a captive audience. Every support should be provided to worksites in order to enable them to adopt and implement this strategy.

Worksites are excellent sites for tobacco control efforts because of the availability of a captive audience

5.4.3 Tobacco cultivation

The cultivation of high-quality tobacco in Pakistan was initiated after 1947, with initial experimental plantations in Sindh; the crop was subsequently moved to NWFP where the climate and soil was found to be most conducive for tobacco cultivation; the crop remains to-date, the major cash crop in NWFP and is the only crop grown in Pakistan whose yield per acre (currently estimated around 2400 kg) is well above the world average; this yield has consistently been on the rise since 1947.[152] According to estimates, Pakistan grew 107,000 metric tons of tobacco on an area of 49,150 hectares in the year 2002.[172] Clearly, there have been alternative forces responsible for these trends.

The tobacco-growing areas in Pakistan are centred on NWFP, Charsadda, Mardan, Swabi, Nowshera and Dargai. Tobacco-growing continues to be practiced despite clear evidence in the agricultural sector of the presence of other more profitable and environment-friendly options.

There are several factors that favour tobacco cultivation. These include increase in export prices, increase in the import value, increase in demand and subsidies. The Ministry of Agriculture does not give direct subsidies to tobacco growers, and in their own words, the government neither *encourages* nor *discourages* tobacco cultivation and has left the dynamics of tobacco cultivation to market forces. A number of subsidies are permissible as part of the stipulations of the WTO Agreement on Agriculture, Article 6.2; these include input as well as investment support to farmers. However, the Government of Pakistan does not provide any direct subsidies of this nature – negative or positive – to farmers. Indirect mechanisms do, however, protect the interests of growers. For example, stipulations of the Martial Law Order (MLO) of 1985 dictate that tobacco companies cannot offer rates less than those fixed for the previous year to farmers for buying crops; this implies that the price of tobacco has not fallen since 1985.

The tobacco industry facilitates tobacco cultivation at several stages, particularly at the time of plantation with special assistance packages aimed to facilitate plantation and ensure quality. The tobacco crop has a guaranteed

market; however, there are at times, disagreements between the grower and the buyer over the terms that underlie financial transaction involving issues that stem from grading and rating of the crop.[173]

Developing alternatives to tobacco cultivation and crop substitution are recognized as being a part of comprehensive tobacco control efforts. However, as long as a market exists for the crop, measures aimed at regulating its plantation may not be comprehensively effective. There are, nevertheless, several strategies that are known to discourage tobacco cultivation; these include provision of guidance to farmers, crop substitution and mixed cropping and ensuring better marketing of alternative crops. These efforts must be initiated alongside other tobacco control efforts albeit with a clear understanding that they have a limited role in tobacco control.[174]

The tobacco-related health education budget of the Ministry of Health amounted to Rs. 2 million in the year 2002

There are several views with regard to developing alternatives to tobacco cultivation. A group of farmers from NWFP deny the possibility; however, such views are not reflective of a long-term vision as part of which crop substitution can clearly be addressed. Majority of the growers in Pakistan agrees that if they are ensured alternative income, they would switch over to other crops and businesses and feel, in particular, that alternative crops such as orchards have an equivalent yield by value.[xi] However, the time lag that elapses between experimental plantation and sustainable fiscal yield and the uncertainty with marketing the crop compared with the situation that exists with tobacco is a strong disincentive for them to diversify their businesses.

The government can take several measures to discourage tobacco cultivation and assist with diversification. Firstly, all indirect subsidies must be withdrawn; secondly, technical assistance for the cultivation of equally remunerative crops should be provided; this should be guided by studies to determine what is feasible and economically viable. Alternative crops, promoted as part of such arrangements, can be given insurance protection. Thirdly, the government should assist with providing income support for tobacco farmers until the process of diversification is complete and sustainable. All these suggested measures have implications for operational research, and for building a working relationship with the growers and ties in the role of the ministries of Agriculture, Commerce and Finance; farmers associations and local NGOs. Such an effort must begin with mapping and registration of growers as such data are presently unavailable.

5.4.4 Public and professional education

The Ministry of Health has been investing in anti-tobacco health awareness campaigns for the last 40 years. However, the budgets allocated for this activity are meagre compared with allocations for tobacco advertising and promotion. This is evidenced by a comparison of the tobacco-related health education budget of the Ministry of Health with the advertising budgets of companies with 98% of the market share. In the year 2002, the former amounted to Rs. 2 million whereas the latter totalled Rs. 61 million.[xii]

[xi] The investment per acre for tobacco cultivation roughly amounts to Rs. 125,000 in Pakistan; the net return on the crop per acre is around Rs. 25,000-30,000 under favourable conditions.
[xii] Total health education budgets for that year amounted to Rs. 255 million.

The advertising budgets of companies with 98% of the market share totalled Rs. 61 million for the same year

There is a general impression that consumers are more aware of the harmful effects of tobacco today than they were decades ago. This can be attributed to investments made in anti-tobacco health education interventions over the years; however, due to the lack of a system to monitor this intervention, an assessment of its impact cannot be made. It is, therefore, imperative that future interventions should encompass sound evaluation strategies and process evaluation measures. Tobacco should be featured prominently as part of the comprehensive behavioural change communication strategy for NCDs; the principles of this approach have been outlined in Section 2. Anti-tobacco health education interventions should also provide information on the magnitude of the damage tobacco can cause and should be able to provide critical information related to the role of tobacco advertisements in the initiation of smoking. In addition, information on quitting must be provided.

High-risk groups such as young women and adolescents deserve special attention. Women in Pakistan are more vulnerable to tobacco use because the socio-cultural norms that previously prevented them from smoking are weakening. This, coupled with a rise in women's spending power and the impact of advertising images of freedom, emancipation, glamour and wealth, are enticing more and more women in urban settings to smoke. In addition, *huqqa* and *naswar* use is socially acceptable in rural areas. There is a clear need to create culturally-relevant awareness among women both in the urban and rural areas through appropriate channels. Such efforts should strongly integrate messages that highlight the ill-effects of tobacco on the foetus during pregnancy, the health hazards of passive smoking and the potential ill-effect on young children in the house.

There is also a potential in using the religious argument for anti-tobacco campaigns. The recently published monograph by EMRO summarizes Islamic rulings on tobacco.[175] This monograph encourages the use of Islamic *fatwas* for tobacco control and highlights the magnitude of influence that the clergy can exercise in promoting tobacco cessation. This potential needs to be harnessed. Tobacco was non-existent in the times of the Holy Prophet Mohammad *(Peace Be Upon Him)* and, therefore, there is no guidance on this matter or else that pronouncement would have been binding. However, by analogy, tobacco has been declared *makroh* (undesirable) by the Council of Islamic Ideology, which supports a complete ban on advertising.

Islamic *fatwas* can be used for tobacco control

Involvement of the media is critical to the public awareness approach. In addition to drawing on their support to disseminate information relevant for health education; it is important to draw their attention to the ways in which tobacco companies have worked hard to thwart policy change over the last several years.[176] Media activities around dedicated days such as the World No Tobacco Day provide a platform for accelerating such efforts.

Professional organizations and groups have a responsibility to sensitize their members to the importance of serving as non-smoking models. This is particularly important as cigarette smoking rates are known to be high among health professionals and students.[177] Help from professional societies and organizations is essential to achieve this objective. Moreover, engaging health professionals to lobby for anti-tobacco activities at the community level is critical. Healthcare providers play an important role in influencing

The Prohibition of Smoking Ordinance 2002 is a step in the positive direction

lifestyles of their patients. It is necessary to involve all levels of healthcare providers in this loop through an approach that has been discussed in Section 2.

5.4.5 Advertising promotion and sponsorship

Tobacco advertising increases the desirability of use as it associates tobacco use with athletic prowess, sexual attractiveness, professional success, adult sophistication, independence, adventure and self-fulfilment. Such advertisements suppress full disclosure in the media, of the health hazards of smoking.

Tobacco companies in Pakistan have vast advertising budgets; the collective marketing expenses of two of the largest companies with 98% of the market share was close to Rs. 1.5 billion in 1999.[178] Numerous sports, cultural and social events in Pakistan have been financed by tobacco industry contributions, largely due to the perceived lack of other financial support mechanisms. Several diverse and innovative strategies are used for advertising and promoting tobacco; these range from the straightforward point of sale, print and electronic media and outdoor advertising, to other more focused efforts that aim at building incentives for wholesalers and retailers and promotional strategies that focus on sport, art, culture and cause-related sponsorships.

There are two kinds of advertising bans: statutory and voluntary. A few of the leading multinational tobacco companies in Pakistan, in compliance with international stipulations, are imposing voluntarily restrictions on advertising. As part of this policy decision, they do not purportedly target non-smokers, conform to international marketing standards by regulating their advertising content and refrain from identifying their advertising displays with sexual or sporting pleasure. They do, however, stress that their advertising campaigns are aimed at brand-switching and target those that have already chosen to smoke.

The Pakistan Tobacco Company (PTC) accepts that sale to minors should be discouraged and has taken measures to discourage adolescent smoking; they recognize that the electronic media is most effective in influencing behaviours of adolescents; this realisation has been the impetus for imposing a voluntary ban on electronic media advertising. This strategy has been set forth despite the clear understanding that this would have a significant negative effect on their business. Whether they truly intend to stop marketing to youth could, however, be questioned as the tobacco industry in the western world has been known, via its own internal documentation, to put forth voluntary bans in order to avoid more stringent governmental regulations.[179] The industry continues to engage in regulated advertising,[xiii] without clear evidence to suggest that this strategy does not influence adolescent choices. In any case, advertising in any form is unacceptable from a public health perspective. Even the concept of *promoting switching of brands* is opposed to the public health stance on tobacco control, which does not stop at deterring non-smokers from taking up this habit but also encompasses the more important dimensions of quitting and cessation, where the public heath

[xiii] For example, billboard sizes have been reduced to 35 square metres.

impact is the greatest. Any form of advertising from a public health perspective is, therefore, opposed to this principle.

There is a general impression that tobacco sponsorship for sports is indispensable. However, that may not be the case. The Pakistan Cricket Board (PCB) disassociated itself from PTC's sponsorship in 1997-98; yet both cricket and PCB have continued to flourish. Another similar success story can be quoted from international experiences with FIFA declaring World Cup 2002 as smoke-free.[180]

The Framework Convention on Tobacco Control (FCTC) recommends gradual phasing out of all types of tobacco promotion and advertising by 2005. It recommends this for countries with *constitutional constraints*, otherwise a comprehensive ban is recommended.

Statutory restrictions on tobacco advertising in Pakistan were non-existent prior to the promulgation of the Prohibition of Smoking Ordinance 2002; earlier laws dealt with the issue of sales to minors and inscription of health warnings. In 1997, the Lahore High Court Bench banned all kinds of cigarettes advertisements on the electronic media on a petition filed by the Pakistan Chest Foundation. However, a larger bench repealed that order citing technical reasons. Subsequently, the federal government came up with Prevention of Smoking Ordinance 2002. The recently promulgated 2002 Ordinance imposes restrictions on tobacco advertising in Pakistan. However, there are issues with this Ordinance as it imposes a partial ban on advertising. This creates ambiguities, making its implementation vague and exploitable. Evidence suggests that while comprehensive bans on all forms of tobacco promotion can be effective in reducing tobacco use, partial restrictions have limited or no effect.[181,182]

These gaps notwithstanding, the promulgation of this Ordinance is a step in the positive direction and in line with international trends which call for gradual phasing out of all kinds of tobacco advertising, sponsorship and promotion by 2005. The Ordinance and its preamble provide the scope around which rules of business can be drafted.

There is a need for conscious efforts to make warnings more effective

Active lobbying efforts are required by all stakeholders to push for further amendments in the Ordinance aiming for a comprehensive ban on tobacco promotion, advertising and sponsorship; groups such as the Tobacco-Free Initiative, Pakistan (TFI-Pakistan) will hopefully play an active part in this endeavour. These efforts come at a critical time when the Ministry of Health acknowledges and has indicated that it is possible to aim for a total and comprehensive ban on tobacco advertising. Nothing less than that is acceptable or effective.

5.4.6 Warnings

The Cigarettes (Printing of Warning) Ordinance 1979 made it binding for manufacturers to print on all cigarette packs, both in English and Urdu, the following warning *'Warning: Smoking is Injurious for Health'*; [183] a subsequent amendment of this Ordinance in 1980 exempted cigarettes meant for exports from carrying this health warning.[184] Subsequently, the 1979 Ordinance was amended in 2002,[185] making it necessary for warnings to occupy 30% of the front and back of cigarette packs. In addition, it is now

mandatory for all electronic media advertisements to devote 20% of the air time to warnings. The larger and more conspicuous warnings come to the consumer at no additional cost to the government; however, they may only be marginally better than the previous pattern of warnings in altering health behaviours of smokers. It is, therefore, necessary to bring about innovations in warning styles based on feedback received from pilot studies conducted in local settings. Successful examples exist of how such innovations have been effective in bringing about behavioural changes. Studies conducted in Canada, where pictorial warnings cover 50% of the pack surface, have also suggested that such approaches are effective.[186,xiv] In light of this evidence, conscious and culturally-relevant efforts need to be initiated to make warnings more effective. [187,188] Given the high illiteracy rate in Pakistan, this may also require pictorial representation of the warning.

The overall design of the cigarette pack also plays an important role in how warnings are internalized – the same way as it plays a part in coining brand image. Many countries are advocating plain packaging. Some also propose the banning of words such as *Mild* or *Light*, as they may convey the impression that these cigarettes are less harmful or contain fewer harmful constituents. Every effort should be made to integrate these lessons to further strengthen warnings.

5.4.7 Price, excise and taxation

In terms of the price index, tobacco products are cheaper and hence more accessible in Pakistan today than they were 15 years ago. This is an inevitable consequence of the lack of use of price and tax policies as a tool to control tobacco consumption despite evidence that the demand for tobacco is *strongly affected by price*. For example, increase in the real price of cigarettes in Canada (because of tax increases) between 1982 and 1992 led to a substantial decrease in cigarette consumption. Similar evidence is available from South Africa, the UK and several other countries. Price increase is known to impact consumption patterns; those in low-income countries are more likely to respond to price increases. Researchers have calculated that if there were a sustained and real 10% rise in the price of cigarettes over the average estimated price in each region of the world, 40 million people worldwide would quit smoking, and many more who would otherwise have taken up smoking, would be deterred from doing so.[189] This calls for the development of a comprehensive price policy for tobacco products, recognizing its special nature and appreciating evidence which points to a clear inverse relationship between cigarette prices and smoking rates. However, the optimum level of taxes for this purpose needs to be determined in Pakistan's context.

Increase in taxes has a flip side also as it leads to an increase in tobacco smuggling. Pakistan faces acute problems in this regard since smuggling of highly taxed products into Pakistan from bordering countries is already a well established industry. The dynamics of this interrelationship are of interest to

[xiv] Some successful examples are: *"Your children imitate you"; "Cigarettes cause cancer of mouth, diseases of gums and teeth"; "Cigarettes cause strokes"; "Tobacco smoke hurts babies."*

the Revenue Department in relation to the possible negative impact that smuggling can have on revenue generation. However, in a public health context, price increase is known to be effective and should be actively pursued. The World Bank and the IMF both agree on the effectiveness of price increase on tobacco consumption. The latter supports the idea of a specific tax on tobacco in order to reduce consumption.[190] With rising poverty and lower incomes in Pakistan, consumption is likely to be more sensitive to price changes, regardless of the inelasticity of demand.

Tobacco is a significant source of revenue in Pakistan.[xv191] Dependence on revenue generated from tobacco is an impediment for tobacco control. Policy thinking needs to be diverted from the focus on gains in the form of revenue to the health costs of tobacco use. It needs to be fully realized that tobacco control is highly cost-effective as part of a basic public health package in low- and middle-income countries and it compares well with other interventions like child immunization.

5.4.8 Dependence and cessation

There are no dedicated smoking cessation clinics in Pakistan

One of the two most important measures that have the potential of impacting tobacco mortality trends is the widespread use of effective means of treating tobacco dependence, especially if cessation rate is dramatically increased.[192,193] Majority of the smokers realize the need to give up smoking but finds it difficult to do so in the absence of any organized effort on smoking cessation. Against this background, there are no smoking cessation clinics in Pakistan even in tertiary care settings; smoking cessation advice is given on an *ad hoc* basis in clinics. In addition, there is no formal training of healthcare providers on smoking cessation and no printed information is available to them through a structured and sustainable mechanism. Moreover, Nicotine Replacement Therapy (NRT), which is an affordable and effective deterrent against smoking, is not registered in Pakistan.

There is, therefore, the need to integrate smoking cessation with healthcare delivery at all levels and to address it as part of professional education. Investment in smoking cessation clinics with equitable outreach is also overdue. These can be developed in the setting of major public sector hospitals; in addition, it should be made mandatory for private sector hospitals to offer such services and guidance. Healthcare providers in BHUs and THQs should be provided with simple tools enabling them to assist patients with smoking cessation. In the context of tobacco use cessation, it is also important to make NRT available in Pakistan through the process of formal registration.

5.4.9 Illicit trade

There are three varieties of illicit trade in tobacco: smuggling, tax evasion and counterfeiting. All three practices contribute to increasing the availability and accessibility of cigarettes in the market and incur losses to the exchequer. According to estimates in Pakistan, the tax-evaded sector has grown from

[xv] Tobacco tax as a percentage of the total revenue: Argentina 4.34%, Australia 3.38%, Brazil 7.37%, Bulgaria 3.63%, Chile 4.10%, China 2.79%, Egypt 1.34%, Finland 2.03%, Greece 8.69%, India 2.43%, Indonesia 3.38%, Mexico 1.41%, Nepal 6.37%, Poland 3.26%, Spain 2.37%, South Korea 3.46%, Uruguay 2.64%, UK 3.23%, Venezuela 2.30%.

Only three product liability cases have been filed to date

holding 10% of the market share in 2001 to 20% in 2002.[162] This results in yearly revenue losses approximating to Rs. 1.2 billion.

Counterfeit cigarettes have 2.4% of the market share in Pakistan.[152] The tobacco industry tends not to acknowledge the magnitude of this issue publicly, as this would have implications for consumer confidence and brand image. Counterfeiting has public health implications as it makes cigarettes more accessible by increasing availability and reducing cost. In case of counterfeiting, manufacturing details, retail mechanisms and trade routes are well established; however, being a sustainable activity, it is hard to break. The government can address this issue by enhancing market intelligence and fixing a minimum price.

Cigarettes are the world's most widely smuggled legal consumer product. According to estimates, 4-6% of world cigarettes are smuggled.[194] Cigarettes are not imported into Pakistan; any cigarette packing which does not have a warning in Urdu is a smuggled item. Ninety percent of the tobacco smuggling in Pakistan is due to trade arrangements with Afghanistan. This practice is becoming rampant in the absence of effective monitoring and surveillance of this trend both at the entry and sale points. The response to this issue involves effective implementation of laws that exist on smuggled contrabands and raising the economic cost of smuggling, thus narrowing the margin between the price of the legitimate and the smuggled product in the market.[195] The use of difficult-to-forge tax-paid markings, excise stickers and printing of unique serial numbers is known to be effective since any tobacco product not carrying such stickers offered for sale can be seized and destroyed even after it enters the country. This is one area where cooperation with the tobacco industry can prove helpful since they have a vested interest in reducing the scope for untaxed tobacco products. Addressing this issue in a comprehensive manner brings in the role of Customs, the ministries of Finance, Commerce and Industries and the local governments.

5.4.10 Liability and compensation

There are several successful examples of tobacco litigation in the developed countries; the internationally recognized Minnesota trial being one of them.[196] However, there is no precedent in Pakistan where a case for liability against the tobacco industry has been filed; public litigation is not a priority and to-date only a few product liability cases have been filed.

Litigation in the area of tobacco control can be approached in two ways. Using articles 186 and 199, the state itself can sue the tobacco industry for losses incurred to the state budget due to the healthcare costs of treating patients who have suffered at the hands of tobacco use. However, this has to be a political decision. Personal liability litigation, which involves demanding compensation based on personal injuries caused by a specific product, is the other mechanism. However, in Pakistan's setting, its application is cumbersome because of underdevelopment of the Law of Totts and antecedent difficulties in establishing causal associations at a *personal level*. However, there is potential in creating awareness about consumers' rights in this connection.

Many products with health benefits are often effectively banned from the marketplace due to burdensome regulatory standards. Against this backdrop, it is ironic that tobacco products are excluded from consumer protection laws, such as food and drug legislation. It is, therefore, necessary to lobby for legislation as part of which tobacco should be subjected to stringent regulations governing pharmaceutical products.

5.4.11 Research and surveillance

As Pakistan grapples with the major toll that tobacco takes on individuals, communities and the health system and establishes a concerted national tobacco control programme, it is essential that policy makers have access to data. For this purpose, data must be generated to inform the decision making process. It is essential to pursue epidemiological and behavioural research and to establish surveillance mechanisms for monitoring tobacco use trends. In addition, it is imperative to pursue policy research of local relevance and to examine tobacco tax policies, marketing and advertising strategies with a view to promoting a smoke-free norm. Research on impact of the non-formal tobacco sector on employment and policy also needs to be locally conducted.[197]

Most importantly, however, with reference to the above-mentioned strategies, it needs to be recognized that there is inadequate capacity both within the public and private sectors in Pakistan to understand the technical and operational aspects of tobacco control. Urgent attention should be given to developing expert capacity so that an effective tobacco control community can be developed within Pakistan.

A number of tobacco control measures can be instituted in the Pakistani setting. However, broad and widely-targeted public health measures entail a more cost-effective use of scarce public health resources than individually oriented measures. Based on this approach, a strategy has been devised to guide future efforts aimed at tobacco control in Pakistan. The Action Agenda items as part of this strategy have been listed below. However, as part of the **Integrated Framework for Action**, tobacco as a risk factor has been grouped alongside other NCDs in an integrated model which combines a range of interventions and actions across NCD domains.

Tobacco - Action Agenda

- Integrate surveillance of tobacco use with a population-based NCD surveillance system. Monitor trends in tobacco use and its determinants.✝
- Feature tobacco prominently as part of the comprehensive NCD behavioural change communication strategy; provide wide-ranging information relevant to all aspects of tobacco prevention and control and smoking cessation.✝
- Institute means to reduce dependence on revenues generated from tobacco and seek alternative means of revenue generation.
- Aim for gradual phasing out of all types of advertising and complete ban on advertising.✝
- Develop and enforce legislation to subject tobacco to stringent regulations governing pharmaceutical products.
- Allocate resources for policy and operational research around tobacco.✝
- Build capacity of health systems in support of tobacco control. Integrate public health programme monitoring and evaluation with NCD surveillance.✝
- Build a coalition or network of organizations at the national, provincial and local levels facilitated by federal and provincial health services to add momentum and legitimacy to tobacco control as part of a comprehensive effort for the prevention of NCDs.
- Integrate guidance on tobacco cessation into health services as part of a comprehensive and sustainable, scientifically valid, culturally appropriate and resource-sensitive CME programme for all categories of healthcare providers.
- Adopt measures to discourage tobacco cultivation and assist with crop diversification.
- Ensure availability and access to Nicotine Replacement Therapy.
- Implement effective legislation on smuggling contrabands and counterfeiting.

✝ **Priority Action Areas**

Priorities within other Action Areas will be determined subsequently

6

Chronic Respiratory Diseases

6.1 Context

Four of the top ten leading causes of death in the world are respiratory in origin – these include lower respiratory tract infections, chronic obstructive pulmonary disease (COPD), tuberculosis and lung cancer.[4] However, in the wake of the disease pattern shifts that are part of the global epidemiological transition, the burden of chronic respiratory diseases (CRD) inclusive of COPD, lung cancer and asthma is consistently on the rise whereas the burden of communicable respiratory conditions is likely to lessen.

6.1 Data on chest diseases in Pakistan

The National Health Survey of Pakistan 1990-94 estimated the burden of chronic bronchitis based on a similar but more conservative definition of chronic bronchitis developed by the American Thoracic Society (ATS).[198] According to history-based criteria, prevalence of chronic bronchitis increases over the age of 65 years; in this age group, prevalence has been estimated at 14% among rural females and 6% among rural males. In the urban areas, prevalence was reported at 9% both among males and females. It has been hypothesized that higher rates of chronic bronchitis observed in females in the rural areas is attributed to high levels of indoor air pollution due to cooking over smoking fires. However, there is a need to demonstrate such causal associations and their determinants so that precise targets for preventive interventions can be developed.

Females in the rural areas have the highest prevalence of chronic bronchitis

Several issues are involved in assessing the magnitude of the burden of CRD in general and COPD in particular, within populations. Mortality data under-represents CRD as it is under-diagnosed and often not listed either as a primary or a contributory cause of death. Few countries have good population-based data on CRD due to lack of a uniform set of diagnostic criteria. In addition, there are issues with estimating the prevalence of CRD accurately, for which measurement of airflow obstruction is necessary. These considerations explain the paucity of population-based data on CRD in Pakistan. Within this context, it is necessary to partner with global efforts to assist with the development of globally acceptable criteria for the diagnosis of CRDs and inexpensive methodologies to monitor COPD, suitable for use in the developing countries.

Ideally, CRD surveillance should be part of a comprehensive NCD surveillance system to facilitate mapping of CRDs and their determinants. However, due to issues inherent to surveillance of CRD, this has not been included in the NCD surveillance system in Pakistan. Tobacco use can be used as a proxy for the magnitude of COPD in populations.

Exposure to environmental pollution is a major risk factor for COPD in Pakistan

6.3 Risks for chest diseases and their prevention

Prevention of CRDs needs to be integrated with a comprehensive NCD prevention and control framework. There is valid scientific justification for this approach, given the commonality of risk factors and preventive approaches. Prevention of CRD necessitates reduction or avoidance of personal exposure to risk factors; these include direct and indirect exposure to tobacco smoke, exposure to air pollution derived from indoor and outdoor sources, occupational exposure to toxic agents, exposure to common allergens, malnutrition, low birth weight and multiple early lung infections. Of these, tobacco has been discussed in Section 5 whereas occupational exposure to toxins has been addressed in Section 7 as part of cancer prevention and control. Malnutrition and infections are outside the scope of the present discussion. This Section focuses on environmental pollution.

Exposure to environmental pollution is a major risk factor for COPD in the developing world, where poverty, lack of investment in modern technology and weak environmental legislation combine to cause high pollution levels.[199] The associations between pollution and disease are complex and poorly characterized for a number of reasons; these include diversity of exposure pathways and processes, uncertainty about levels of exposure, long latency time and effects of cumulative exposure. Despite these issues, particulate matter pollution has an established causal association with COPD.[200] This includes both indoor and outdoor air pollution. Indoor air pollution takes many forms; these include smoke and solid fuel combustion and organic compounds in modern buildings. Indoor air pollution from combustion of biomass/traditional fuels and coal is known to be an important risk for COPD in Pakistan. In the NHSP, more females compared with males were shown to suffer from chronic bronchitis in the rural areas. It is important to examine these trends and their determinants so that appropriate public health interventions can be developed to address this issue.

Outdoor air pollution is also a major issue in Pakistan, particularly in the crowded metropolitan areas. In many cities, air pollution levels are known to have crossed safe limits whereas in others, they have reached threshold limits.[201] Particulate matter in large cities is largely derived from vehicular and industrial emissions, burning of solid waste, brick kilns and natural dusts. A recently conducted ambient air quality study examined pollution levels in traffic congested areas in Islamabad, Karachi and Rawalpindi; the study revealed that the average suspended particulate matter in our cities is 6.4 times higher than WHO guidelines and 3.8 times higher than Japanese guidelines. This raises serious concerns relating to the risks that such pollution levels pose to the health status of populations. A number of factors can be held accountable for this, foremost among them being increased traffic load, bad road conditions, unpaved roadsides and other natural and mobile sources.

The number of vehicles in Pakistan has increased from 0.8 million to about 4.0 million within 20 years, showing an overall increase of 388% with an annual compound growth per annum of 12%. Over the last two decades, maximum growth has been seen in two-stroke vehicles, which are known to be the major source of particulate matter because of the use of inferior quality

Public health strategies must be instituted to reduce outdoor and indoor air pollution levels

lubricants.[198] Diesel vehicles emit excessive graphitic carbon (visible smoke) due to several factors. High content of lead in gasoline further contributes to this. Moreover, industries such as cement factories, fertiliser plants, stone crushers and primitive brick kilns that are not sensitive to anti-pollution technology are further contributing to this trend.

Several public health strategies can be instituted to reduce outdoor and indoor air pollution levels. These include reducing emissions from industrial and other sites with potential to pollute the environment, conversion of vehicles to Compressed Natural Gas (CNG), avoidance of vehicle overloading, use of better quality lubricating oils, and other measures to care for the environment. Recently, as part of a pilot activity, rickshaws have been converted to CNG – this programme has implications for reducing the emissions of particulate matter. The public health potential of other such interventions needs to be determined. In particular, research must be conducted to quantify the magnitude and determinants of diseases attributable to indoor air pollution in the rural areas. Appropriate public health strategies should be designed to reduce risks in such settings. The broader contextual framework of environmental protection relating to this has been discussed in Section 7.

Since asthma has a low fatality rate, it draws less attention than other respiratory conditions even though it affects about 150 million people worldwide. Studies undertaken in Pakistan over the last decades provide growing evidence of an increase in atopic diseases and sensitization to common allergens. For asthma, primary prevention implies prevention of sensitization to factors that might subsequently induce disease; this has been discussed in the section on pollution. In case of occupational asthma, early detection is essential to prevent further progression and to ensure cost-effective management.

6.4 Chronic Respiratory Conditions - Action Agenda

- ✍ Partner with global efforts to assist with the development of globally acceptable criteria for the diagnosis of CRDs and inexpensive methodologies to monitor CRDs, suitable for use in the developing countries. Integrate surveillance of CRDs, with a population-based NCD surveillance system when feasible.
- ✍ Integrate prevention of CRDs with a comprehensive NCD prevention and control framework.
- ✍ Examine trends in outdoor air pollution levels and examine their determinants in order to develop appropriate public health interventions.✝
- ✍ Conduct research to quantify the magnitude and determinants of chronic lung diseases attributable to indoor air pollution both in the rural and urban areas. Appropriate public health strategies should be designed to reduce risks in such settings.✝
- ✍ Integrate guidance CRD prevention and control into health services as part of a comprehensive and sustainable, scientifically valid, culturally appropriate and resource-sensitive CME programme for all categories of healthcare providers.
- ✍ Refer to Action Agenda in Sections 3, 5, 7.

✝ **Priority Action Areas**
Priorities within other Action Areas will be determined subsequently

7

Cancer

Commonest cancer sites amongst males in Pakistan: lungs, oral cavity and larynx

7.1 Context

Cancer is a significant contributor to the global disease burden. This burden is estimated to increase from the currently reported 10 million new cases each year to 15 million by the year 2020; more than 60% of the new cancer cases will occur in the less developed parts of the world. Presently, cancer is known to be the second most common cause of death in the developed countries, and evidence points to the emergence of a similar trend in the developing countries.[202]

Pre-empting cancer is a major challenge. Experts drawn from all over Pakistan convened at Karachi in 1990, with support from the WHO headquarter, to develop recommendations addressing a range of dimensions relating to cancer prevention and control in Pakistan".[203] However, as cancer prevention did not feature as a priority area within the health sector, the recommendations could not be followed through.

Scientific evidence shows that at least one-third of the annually occurring cancers can be prevented and another one-third diagnosed early or down-staged at diagnosis. This can lead to significant reductions in cancer-related mortality.[202] It is, therefore, imperative to invest in public health approaches that focus on minimizing exposure to the risks of cancer and step up early detection. Both these approaches are a critical component of a cancer prevention and control programme and are addressed as part of this Action Plan. Other dimensions encompassing pain relief, palliative care and treatment – also known to be cost-effective – should also be included in a cancer control programme; however, these are outside the scope of this initiative.

There are several gaps in evidence relating to valid and locally applicable strategies for preventing common cancers in the Pakistani setting; there is a need to bridge these gaps by structuring appropriate studies; however, this is likely to have time implications. In view of this, the Action Plan acknowledges that adequate treatment facilities and access thereto are urgently needed to cope with the growing number of cancer patients. The Action Plan also recognizes that pain relief and palliative care are cost-effective and need to be prioritized alongside prevention and control efforts. This is particularly important as stimulating early detection in a previously unscreened population will uncover many cases of advanced cancer.

Commonest cancer sites amongst females in Pakistan: breast, oral cavity and gall bladder

7.2 Data on cancers in Pakistan

7.2.1 Data on adults

Incident cancer data for the period 1995-1997 from the population of Karachi District South (1.7 million; census 1998),[204] have been presented in the 'Cancer in Five Continent' series volume VIII published by the International Agency for Research on Cancer (IARC), WHO. A total of 4,139 new cancer cases were registered during this period: 2,086 in males and 2,053 in females. The incidence rates for all cancer sites combined were 77.8 per 100,000 (crude); 139.1 per 100,000 (age-standardised rates [ASR]) for males and 89.5 per 100,000 (crude); 169.5 per 100,000 (ASR) for females.[205] Among males, lung cancer (ASR 21.0) was the most frequently recorded malignancy, followed by cancer of the oral cavity (ASR 15.6) and cancer of larynx (ASR 8.8). Breast was the most common cancer site in females, accounting for one-third of cancers (ASR 53.1), followed by cancers of the oral cavity (ASR 15.3) and ovaries (ASR 10.9).[206]

Reporting data on the Karachi Division, (population 9,802,134; males 5,261,712, females 4,540,422) in another study covering data from 1998-1999, cancer of the gall bladder was reported as the third most common cancer in females. The hierarchical order of other cancers remained identical to that observed in Karachi South District. Karachi reports the highest incidence of breast cancer for any population, except for Jews in Israel. [8]

7.2.2 Paediatric data

Data from the Karachi South Registry for the year 1995-1999 reported a total of 347 paediatric tumours, representing 4.6% of all new cancer registrations. Males outnumbered females (2:1; 61.1 and 38.9%, respectively). Leukaemias, with a marginal male predominance, were the most common diagnostic group accounting for 26.8% of all the cases. [205] A high peak for acute lymphoid leukaemia was seen in males in the 10-14 year age group, whereas the same trend was observed for females in the 5-9 year age group. Lymphomas formed the second most common childhood cancer group, accounting for 18.7% of the childhood cancer cases; peak incidence was observed in the 5-9 year age group in both genders. Glial cancers, especially astrocytomas, accounted for half the cancers in both sexes, with a peak incidence in both genders in the 10-14 years age group. Embryonic cell tumours were observed in the 0-4 age group. A particular cause of concern was the childhood hepatocellular carcinoma cases in the Hepatitis-B virus positive children. In the 10-14 year age group, malignancies of the bone and soft tissue sarcomas were the predominant morphology.

Data from Karachi Division (1998-1999) showed an identical incidence pattern – 4.4% of all new cancer case registrations and a male-female ratio of 2:1. The characterisation of malignancies was also similar, with leukaemias being the most common diagnostic group in both genders, followed by lymphomas in males and malignancies of the brain in females and vice versa for the third most common cancer. Malignancies of the bone were the fourth most common group in both genders.

Institutional studies carried out at the Pakistan Institute of Medical Sciences (PIMS) reported similar results.[207] The relative frequency of leukaemia was the highest, followed by central nervous system tumours (CNS) and lymphomas. A pathology-based study carried out at AKUH showed that within solid tumours, lymphoma was the commonest, followed by CNS tumours and osteosarcoma.[208] Studies have also reported retinoblastoma as the commonest tumour followed by lymphoma and leukaemia.[209,210]

7.2.3 Regional data on specific cancers

The pattern of malignant tumours in northern Pakistan has been reported in a retrospective study. Among males, lymph node, blood (leukaemia), skin, prostate, colorectum, bone and stomach were the most common cancer sites whereas in the case of females, breast, skin, ovary, blood (leukaemia), gall bladder, thyroid and bone were the common cancers in order of priority. In the paediatric age group, leukaemia, followed by lymphomas, was the common tumour.[211]

Cancer data from Quetta,[212] (population 759,245; males 425,474, females 333,771) registered at the Karachi Cancer Registry were reported for a two-year period (1998-99). The commonest cancers in males were cancers of the oesophagus, lymphoma, liver, stomach, skin, bladder and prostate. In females, the commonest cancer site was oesophagus, followed by breast, lymphoid tissue (lymphoma), skin, ovary, gall bladder and liver.

7.2.4 Trends in cancer pattern

A continuous monitoring system with comparable data sources is a prerequisite for extrapolating trends in cancer incidence over the years. Although nationally representative data for Pakistan are lacking, data from the Karachi Cancer Registry indicate that cancer has been on the rise. This data source has reported no change in the hierarchical pattern of cancers for nearly a decade; in addition, a gradually increasing incidence of all cancer sites has been reported. Clearly, in the absence of a comprehensive cancer control strategy, trends were not likely to reveal any dramatic changes.

Commonest cancers in Pakistani children: leukaemias, lymphomas and CNS tumours

It is conventional to set up cancer registries for continuous monitoring of cancers or cancer surveillance. The next section deals with the situation as it relates to cancer registration and surveillance in Pakistan, the strengths and gaps of what exists on ground and the suggested course of action to bridge these gaps. This section also deals with a variety of generic issues that relate to cancer registration and their implications in the native Pakistani setting.

7.3 Cancer registration in Pakistan

Population-based cancer registration is a continuous process of registration, coding, computerisation and analysis of data in a geographically defined population. Further characterization, monitoring and assessment of risk profiles are also part of this process. The objective of this exercise is to have access to reliable and authentic data on a continuous basis in a uniform and standardized manner so that data can be comparable; for this purpose, quality assurance and uniform data collection methods need to be maintained. Ensuring that the process is sustained on a continuous basis is critical to this exercise. Lack of continuity in supporting such initiatives has been identified

as the major barrier to such efforts in Pakistan. The overall relevance of the concept of registries in the contextual framework of being necessary for evidence generation is often ignored. Additionally, duplication of effort, lack of consolidation and the absence of a central mechanism to utilize evidence generated for policy building are other barriers.

For Pakistan, it is advisable to have cancer registries that centre on specific populations representative of different cultural and ethnic groups. In addition, global validity parameters relating to comparability and quality control on cancer registration necessitate that cancer registries in a country should conform to CI 5 standards and that registries within countries should be registered with IARC.

In Pakistan, the only registry that conforms to CI 5 standards is the Karachi South Cancer Registry. Though there may be issues relating to generalizability of data as the sampled population is culturally and ethnically distinct, there is a general agreement that the data outputs of the registry and IARC projections for Pakistan are valid to plan interventions at the national level at this point in time.[213] There is unanimous agreement that the top ten and the top four cancers in Pakistan would remain the same even if the hierarchical pattern changes, irrespective of the area where trends have been studied. The notable exception to this is the increase in incidence of oesophageal cancers in the west of NWFP and Balochistan along a belt that stretches from Iran, across areas all along to the Caspian Sea. Predispositions to this trend need to be determined.

It is better to extrapolate to comparable populations from a good registry than to draw inferences from a poor one on site

Notwithstanding that the Karachi South data may be sufficient to plan public health interventions at this point in time,[214] every effort should be made to consolidate and bring other regional registries to internationally acceptable standards. However, caution needs to be exercised as stimulating too many registries is neither feasible nor essential. It is better, by far, to have just a few that are good and conform to international standards than many that are not and better to extrapolate to comparable populations from a good registry than to draw inferences from a poor one on site. A review of the prevailing situation is useful in this regard.

The Karachi South Registry has been extended to cover the Karachi Division. A Quetta Tumour Registry has been developed in collaboration with the Pathology Department of the Aga Khan University. In addition, the Armed Forces Registry based at the Armed Forces Institute of Pathology in Rawalpindi also has the same status. All these registries competing for CI 5 statuses already cover more than 70% of the respective catchment areas; the remaining sources of data are being tapped in order to acquire the 95-98% completion criteria required by IARC. Therefore, as part of the first phase of up-gradation and consolidation of cancer registration in Pakistan, resource allocation should be prioritized and ensured on an ongoing basis in order to facilitate continuous monitoring of cancers.

In the next phase, registries could also be established in areas that centre on other representative populations. There could be several criteria for choosing other sites for developing registries in Pakistan. The availability of a large service dedicated to oncology is conventionally thought of as being a focal point where the necessary expertise and resources are generally available to

support a registry. Also key to the development of a registry is the availability of the capacity to characterize cancers, reflective in the availability of a well functioning and standardized laboratory; without this facility, it may be impossible to ensure quality and comparability of data. Ideally, within the geographical context of Pakistan, it is also necessary to develop at least one registry in every province so that local data could help provincial planners allocate resources within the province. This aspect is of special relevance in Pakistan, given that health is a provincial subject in the country.

In view of the above-mentioned criteria, it is advisable to support efforts so that registries can be built on a few more representative populations. Within the framework, it is advisable to set up a registry in Peshawar; this effort is also warranted in view of the differing patterns in the prevalence of oesophageal cancers which are seen in the band of area to which NWFP belongs. Existing efforts at the Institute of Radiotherapy and Nuclear Medicine (IRNUM), therefore, need to be re-channelled towards developing a population-based registry. In addition, a population based registry needs to be set up in Lahore. Efforts in Lahore have paved the way for building a broad-based coalition led by experts at the Shaukat Khanum Memorial Cancer Hospital; this coalition is geared to developing a Lahore-based population registry for which the preliminary work, in terms of planning meetings, has already been completed. In addition, a consensus has been achieved around a position paper and a site visit conducted by nominated representatives of IARC. Every effort should be made to support these initiatives ensuring that these have institutional protective mechanisms to make them viable and sustainable over the long term.

Existing and future efforts focused on establishing pathology- and oncology-based tumour registries should be aimed at eventually linking with, contributing to, or developing into population-based tumour registries. For example, the oncology-based registry currently being developed at PIMS, Islamabad should be structured in a manner, that would enable it to mature into a population-based registry for Islamabad; the alternative is to have it serve as a data collecting point for the long standing pathology-based registry at AFIP, Rawalpindi, which serves the same population and can more easily be developed into a population-based registry.

The Karachi Cancer Registry, which has attained IARC Certification and is currently involved in capacity-building of many other registries in Pakistan, could serve as an official resource site for the development and strengthening of other cancer registries in Pakistan. This effort could be supported through WHO funding and other sources.

There are several technical and ethical issues with cancer registration, especially with newly-evolving registries. Ethical issues relate to confidentiality and intellectual ownership of data, particularly in the case of sharing of hospital data with population registries, whereas technical issues centre on standardization and the capacity to characterize cancers in relation to uniformity in coding, staging and grading. It is proposed that a multidisciplinary task force be constituted to serve as an advisory and supervisory body to develop and implement guidelines relating to these matters. The WHO Cancer Coordinator for Pakistan has recently developed

Preventive strategies and early detection are shown to reduce cancer mortality

the National Cancer Control Council. The Council's mandate is to facilitate the inclusion of all stakeholders in a consultative process, facilitate the development of consensus on technical matters and to uphold ethical values. It is proposed that both the mandate and representation of this Council be broadened. This Council should be entrusted with the task of upholding principles and ethics and providing guidelines on matters related to confidentiality and intellectual ownership. It should be structured to facilitate broad-based dialogue on technical matters related to quality control and standardization within the framework of cancer registration by entrusting this function to sub-committees. A set of transparent criteria should guide inclusion of stakeholders in this council; it should be mandatory for all data sources to be represented. Council members should be selected on merit, based on their previous contribution to the science of cancer prevention and control.

7.4 Cancer prevention and control

Existing and previous efforts relating to cancer prevention and control within the public health domain in Pakistan have largely focused on cancer registration and the setting up of cancer registries. It needs to be recognized that within the paradigm of cancer prevention and control, registration of cancers –if appropriately achieved – plays the initial part of quantifying the magnitude and monitoring trends. It is an exercise intended to provide evidence for health policy planners to base their public health interventions and strategies on. The key element, however, is the actual prevention and control-related measures with implications for reduction in cancer morbidity and mortality.

Preventive strategies and early detection are shown to reduce cancer mortality.[215,216] Early detection comprises early diagnosis in symptomatic patients and screening in asymptomatic but *at-risk* populations. With early detection there are greater chances of curative treatment being successful; this is particularly the case in cancers of the breast, cervix and oral cavity.

The World Health Organization has issued policy and managerial guidelines for development of cancer control programmes within countries.[202] This document highlights the need for adopting a comprehensive strategy in order to address cancers in a prevention and control framework. It also outlines a set of options for cancer control and prevention, which countries can modify and adapt to fit local situations based on the resources at hand. Within this framework, Pakistan can be characterized as belonging to an overlap situation between the 'Low level of resources: scenario A' and the 'Medium level of resources: scenario B'. In conformity with the former, resources for chronic diseases are very limited, the population is predominantly rural and infant mortality is high; in this setting, communicable diseases and malnutrition are the major cause of morbidity and mortality, especially for children, and cancer is one of the leading causes of death over the age of 15. However, in conflict with the former, exposure to tobacco and other environmental carcinogens is high and infrastructure and human resources for developing cancer prevention, early detection, diagnosis, treatment and palliative care are available in a highly limited quality, and in most cases, are not accessible.

Moreover, several weaknesses are inherent to the planning process within the domain of cancer prevention and control in Pakistan.

Table 7.1 Strategies for the eight most common cancers in Karachi – females

Tumour ?	ASIRs	Frequency %	Primary prevention	Early diagnosis	Curative therapy	Pain relief/ palliative care
Breast?	69.1	34.6	+	+ +	++	++
Mouth/pharynx?	23.5	17.4	+ +	+	++	++
Cervix?	8.6	4.1	+	++	++	++
Oesophagus	8.6	3.7	+	-	-	++
Ovary	7.8	4.2	+	-	-	++
Lymphoma	7.2	3.5	+	+	++	++
Gall Bladder	5.8	2.6	++	++	++	++
Skin?	5.6	2.6	++	++	++	++
Total		72.7				

? Listed in order of the eight most common tumours globally
? Curative for the majority of cases provided they are detected early
+ + effective; + partially effective; - not effective

There is an explicit understanding that clear benefits exist with implementing a cancer prevention and control strategy, regardless of the fiscal situation of the country since evidence-based guidelines exist to ensure the most efficient use of existing resources. Specific Action Agenda items on cancer prevention and control as part of this Action Plan have, therefore, evolved in the light of this evidence. Within this framework, prevention and control of cancers in Pakistan will be discussed under two broad categories – mitigating exposure to risk and early detection or screening as they relate to individual cancers.

Table 7.2 Strategies for the eight most common cancers in Karachi – males

Tumour ?	ASIRs	Frequency %	Primary prevention	Early diagnosis	Curative therapy	Pain relief /palliative care
Mouth/pharynx?	30.7	17.4	++	+	++	++
Lung	25.5	11.7	++	-	-	++
Larynx	11.8	6.1	++	+	++	++
Urinary bladder?	9.9	4.8	++	+	++	++
Prostate	9.8	4.1	+	+	++	++
Lymphoma	9.6	7.0	+	+	++	++
Colon/rectum?	7.8	4.4	+	-	+	++
Oesophagus	6.3	3.7	+	-	-	++
Total		59.2				

? Listed in order of the eight most common tumours globally
? Curative for the majority of cases provided they are detected early
+ + effective; + partially effective; - not effective

The following section deals with cancers that are preventable by way of minimizing exposure to risks such as in the case of tobacco and areca nut-related cancers, whereas the subsequent section deals with cancers where the potential for prevention exists through early detection as in the case of breast and cervical cancers. In the former case, the emphasis will be on risk reduction whereas in the latter, early detection strategies will be discussed in the context of individual cancers. However, in many cancers a combination of both these approaches is relevant.

7.4.1 Risks for cancer

Prevention means eliminating or minimizing exposure to risks. Risks to cancer may be lifestyle, occupation or environment-related. Table 6.1 lists factors that have epidemiological associations with cancers in western populations. These need to be validated in the Pakistani context. There is, therefore, the need to conduct appropriate studies so that precise targets for preventive interventions can be determined.

Table 7.3 Factors epidemiologically associated with cancers

Risk factors	Cancers
ENVIRONMENTAL	
Areca nut ?	Oral cavity, pharynx
Diet	Breast, oesophageal and colorectal, oral, gastric
Physical activity	Breast and colo-rectum
Tobacco	Lung, oral cavity, larynx, pharynx, oesophagus, urinary bladder
Overweight and obesity	Oesophagus, colo-rectum, breast, endometrium and kidney
Alcohol	Oral cavity, pharynx, larynx, oesophagus, liver and breast
Hepatitis B and C	Liver
Human papilloma virus	Cervical
Helicobacter pylori	Gastric, maltoma
Aspergillus (aflatoxin)	Liver and as a co-risk factor for oral cavity
OCCUPATIONAL	
Aniline dyes	Urinary bladder
Asbestos	Lung, pleura and peritoneum
Benzene	Leukemia
Uranium	Lung
Chromium	Lung
Vinyl chloride	Liver, angiosarcoma, bladder
OTHERS	
Gall stones	Gall bladder

? Epidemiological association established in Pakistan

7.4.2 Lifestyle risks for cancer

7.4.2.a Tobacco: tobacco is the single largest preventable risk factor for cancer, accounting for 30% of the cancer-related deaths in the developing countries.[217] Section 5 discusses tobacco control.

7.4.2.b Diet, physical activity and obesity: diet, physical activity, overweight and obesity have been described as preventable risk factors for CVD and cancer in western populations. Their association with cancers in Pakistan needs to be determined so that appropriate preventive strategies can be developed.

7.4.2.c Alcohol: alcohol does not feature as a major public health issue in Pakistan. However, the trend of alcohol consumption is anecdotally known to be high in the higher socio-economic class. The magnitude of alcohol use needs to be determined in Pakistan.

7.4.2.d Areca Nut: areca nut leads to submucus fibrosis (SMF); 7.6 % of the cases of SMF develop squamous cell carcinoma of the oral cavity.[218] The use of areca nut is largely specific to south Asia and a few other parts of the world with south Asian settlements. In Pakistan, its use is commoner in the south, particularly within the Urdu-speaking population. Areca nut is not grown in Pakistan; it is imported from Indonesia and India and during its transportation, is likely to be contaminated with aspergillus and other biological contaminations, which are hypothesized as being carcinogenic. Within Pakistan, areca nut imports, distributions and retailing is not regulated despite clear evidence of its causal associations with cancer.[218,219] In order to avoid exposure to this carcinogen, legislative measures must be enacted and effectively enforced to regulate its import and ensure that arriving consignments are not contaminated; alongside, efforts should be initiated to diversify livelihoods of those dependent on areca nut retailing. Health education efforts should aim to step up oral self-examination. In addition, healthcare providers must be sensitized to the need to examine oral cavities of all, particularly the high-risk groups, for suspicious lesions.

Carcinogenic agents are used as part of the manufacturing process in several sites in Pakistan

Awareness needs to be created about risks to cancer in general. However there are presently no comprehensive health education initiatives focused on cancer prevention and control. The only effort at the national level has involved a mini electronic media intervention by the National Programme for Family Planning and Primary Health Care/Health Education Department involving 100 television spots aired for a duration of 52 seconds at a time, in the last five years.[220] These television spots drew public attention to the early warning signs of cancer. However, this is not a sustainable activity as prevention of cancers is presently not part of the programme's mandate. Cancer associations and societies have also been involved in *ad hoc* efforts to develop patient information materials in selected hospitals; these efforts remain isolated without recognizable impact. It is, therefore, important that a comprehensive health education programme addressing lifestyle and environmental risks to cancer be developed. Cancer prevention must be integrated with the NCD behavioural change communication strategy.

Healthcare providers at all levels need to be trained to reinforce health education messages and to play a role in creating awareness about early

Poverty, ignorance, unemployment and the consequent desperation for a livelihood are issues that often overshadow concerns for safety in an occupational environment

cancer detection. Prevention and control of cancers should, therefore, be a part of the NCD training package referred to in Section 2.

7.4.3 Occupational and environmental risks to cancer

Several chemical agents including aniline dyes, asbestos, benzene, uranium, chromium, vinyl chloride etc., have been shown to be carcinogenic in western populations. There are several industrial settings in Pakistan where these are used.

Aniline dyes, known to cause cancer of the bladder, are used in printing presses, dyeing departments of textile industries, tanneries, and industries incorporating dyeing treatments. Such industrial units are scattered all over the country. Asbestos, known to be a causative agent for lung cancer and mesothelioma, is used principally in glass industries at Hasanabdal, Attock, Gadoon Amazai, Lahore and Karachi. It is also in use where fireproofing materials, insulators and auto-brakes are manufactured. Several other industrial units involved in electroplating and construction of batteries and plastic stabilizers in Hattar, Karachi, Lahore and Gujranwala are potential sources for chromium exposure. In addition, several industrial plants manufacturing plastics in Gujranwala, Lahore, Faisalabad, Sialkot and Gadoon Amazai use vinyl chloride. There are also several industrial sources for benzene and butadine in smaller production settings.

Clearly, there are a variety of industrial settings with production facilities of varying sizes ranging from cottage units involved in dyeing, vehicle maintenance etc., to medium-sized facilities such as tanneries, plastic plants etc., to large industries such as textile units where carcinogenic agents are used as part of the manufacturing process. In such settings, risks to cancer need to be recognized and regulated so that exposure to those in contact with these agents and those inadvertently exposed to them, is minimized. This has implications for minimizing exposure to workers and those in the vicinity of a worksite.

7.4.3.a Reducing exposure to those in vicinity of an industrial site: industrial units in Pakistan fall under the jurisdiction of the Ministry of Environment, which is responsible for regulating potentially harmful raw materials. The Ministry of Environment's efforts culminated in the promulgation of the Pakistan Environmental Protection Ordinance (PEPO) in 1976 which was enacted in 1983. However, it was only after a decade that the National Environmental Quality Standards (NEQS) were established and notified in Pakistan and was not until 1997 that the Pakistan Environmental Protection Act (PEPA) was passed and enacted. Part of the mandate of this legislative framework was to ensure safety standards in industrial settings.

The Pakistan Environmental Protection Act 1997 paved the way for establishing a Council for Environmental Protection (CEP) and provincial environmental protection agencies; in addition, specific judicial institutions (environmental tribunals and magistrates) with defined powers were also established. It was on the recommendations of CEP that NEQS were revised in the year 2000 through broad-based consensus involving active support of the United Nations Environmental Programme (UNEP) and the United Nations Development Programme (UNDP). Guided by 32 parameters, the

NEQS are reflective of international best practices and are applicable to municipal and industrial effluents, industrial gaseous emissions, motor vehicle exhausts treatment systems in industry and ambient air concentrations of various substances in the work environment. Alongside, the National Environmental Action Plan (NEAP) was approved in 2001, and subsequently, a support programme (NEAP-SP) was initiated by UNDP. Despite this elaborate chronology of events that paved the way for a seemingly sound environment for occupational health, neither have the NEQS been enforced in industrial settings, nor have any attempts been made to upgrade standards in this regard.

As stipulated in the NEQS, industries are required to monitor their own gaseous and effluent discharge and report them to the Ministry of Environment as part of the Self-Monitoring and Reporting Programme (SMARP). Based on the industries' self-assessment of their own effluent discharge, an Environmental Pollution Charge is meant to be levied on violators; this needs to be verified once a year by an inspection team from the Ministry of Environment. The strategy was devised in view of the limited resources at the disposal of the Ministry of Environment to monitor these units on a regular basis. However, the strategy was largely unsuccessful as only a few out of the 50,000 operating units within the country have been reporting their effluent discharge voluntarily, albeit on an irregular basis.[221] The Ministry of Environment does, from time to time, collect samples for analysis from different sites; however, there are issues and limitations with its ability to analyze these samples with only one operating laboratory in Islamabad and another in Lahore. Clearly, this implies that the NEQS will have to be revised to redefine the role of independent and transparent third-party monitoring of effluent discharge. It is also important to invest in infrastructure facilities that are capable of specialized analysis necessary for such monitoring efforts.

There are also ethical issues around the 'Environmental Pollution Charge' which is levied on industries as part of the stipulations of PEPA. As part of this, industries that are known to release excess pollutants are required to pay additional charges. There are several issues with this strategy, firstly, self-monitoring brings in an unacceptable level of bias; secondly, industries are free to pass on the burden of the added cost to the consumer, most importantly, this is aimed at *minimizing* effluents – this is in clear violation of public health principles, which warrant that exposure to such effluents be *contained*. There is, therefore, a clear obligation on part of the Ministry of Environment to assume charge for enforcing NEQS in industrial settings; this will also provide an opportunity to assess risks to workers and to deliberate on measures to mitigate them.

There are no data on the incidence of cancer in a defined workforce

7.4.3.b Containing risk to workers: several issues need to be addressed in order to contain exposure to carcinogenic agents in the workplace. The initial step is quantification of the magnitude of the issue. There are no data on the incidence of cancer in a defined workforce at higher risk of exposure to carcinogenic agents within an industrial setting. Such data can be available at no additional cost. A review of the Social Security System in Pakistan (discussed in Section 8) has shown that detailed records of all the workers

secured under the scheme are available; these data can be analyzed to extrapolate cancer trends in high-risk populations. In addition, there is a need to establish causal associations of risk factors with cancers in a native Pakistani worksite setting so that precise targets for preventive interventions can be established with certainty. In this regard, case-control studies are of particular value in occupational settings and are also known to be cost-effective.

Another important aspect of work safety involves educating workers to take appropriate protective measures. These must be instituted in tandem with regulatory measures as regulation works better when combined with information dissemination, education and communication.

During a visit to a factory where asbestos was in use, it was observed that most workers were not aware of the inhalation-related aspects of risk; masks were also not made available to them. Moreover, there has been no assessment of knowledge and attitudes of workers in a high-exposure setting, which would have implications for designing and enforcing relevant protective measures. There are several fundamental issues that will continue to undermine any efforts in this direction. Poverty, ignorance, unemployment and the consequent desperation for a livelihood are issues that often overshadow concerns for safety in an occupational environment. Currently, Pakistan's labour laws outline the need for every worker to be protected from harmful substances in a work setting and imply that it is the liability of the employer to ensure this; however, there are several issues in enforcing the law. Stricter legislative measure will have to be adopted and enforced through transparent regulatory mechanisms in order to address these issues.

Ethics of screening require that one must offer a benefit

Several gaps have been identified in chemical handling in industrial sites. Material Safety Data Sheets (MSDS) are usually not distributed with chemical containers in Pakistan. These are chemical information sheets intended for display on all chemical containers and boxes; they provide information about the health and safety effects of a chemical and outline safety precautions for its safe usage and storage. These sheets also include information on first-aid measures that need to be taken in case of accidental exposure. The supplier has a legal obligation to provide the client with this information once a purchasing decision has been made. It is mandatory for the facility owner/operator to ensure that all employees are familiarized with and have access to them. Failure to distribute MSDS reflects a lack of compliance with stipulated regulations and is in violation of prescribed rules. Clearly, there is a need to analyze why this has been the norm and what can be done to upgrade practices in this regard. The Lahore-based Centre for Improvement of Working Conditions and Environment has recently been involved with creating awareness about chemical safety;[222] they have also been involved with translating MSDS into Urdu. However, this is a provincial structure with limited outreach. It is essential for the Ministry of Environment to explore the feasibility of building partnerships and further strengthening such structures to achieve mutually compatible goals.

It should be made mandatory for all containers that contain dangerous chemicals to be labelled properly and to be safely stowed. Individuals handling these chemicals should wear personal protective gear. In addition,

there should be regular monitoring of those likely to be exposed. Monitoring air quality can help in alerting employees, thus preventing the inhalation of hazardous chemicals

7.4.4 Early detection programmes

Early detection programmes in cancers can be classified into two groups; those that aid diagnosis in symptomatic populations and those aimed at screening asymptomatic high-risk populations. The latter approach is particularly helpful in cancers of the breast, cervix, mouth, larynx, colon, rectum and skin. The concept underlying this approach is based on the assumption that early detection will improve chances of success of curative treatment. This is also particularly relevant as 70% of the cancers in developing countries, as opposed to only 20% in the developed countries, are in stages 3 and 4 at the time of diagnosis. [202] Late diagnosis contributes to increased mortality; evidence shows that by stepping-up patient education aimed at altering professional help-seeking behaviour and by educating the population to recognize the early warning signs such as lumps, sores that fail to heal, abnormal bleeding from the orifices, persistent indigestion and chronic hoarseness, tumours can be down-staged at diagnosis. This, in turn, leads to an increase in cancer survival.

Mass population mammography is not recommended as a public health strategy in Pakistan

However, there are several issues with this assumption; cancer detection and treatment are a continuous process; one must follow the other. Early detection has limited value, unless followed by treatment. There are limited facilities for cancer treatment and palliative care in Pakistan and those that exist are inaccessible to the vast majority. This means that by launching an early detection programme, there will be a high proportion of relatively advanced cases over the initial years of the programme. As ethics of screening require that one must offer a benefit and not just a label, pain control and palliative care need to be prioritized; these approaches are important as both are known to be cost-effective.

Early detection programmes include screening and health education aimed at altering patient behaviour towards seeking care. The following section deals with population and high-risk screening. The discussion will centre on individual cancers.

7.4.4.a Breast cancer: extrapolating data from the Karachi South Registry to the female population of the country, there are an estimated 30,000 new cases of breast cancer in Pakistan each year.[205] The burden of disease warrants that screening programmes be initiated to diagnose breast cancer in its early stages so that survival in this group may be prolonged by initiation of timely therapy.

There are three approaches to breast cancer screening: self-examination, examination by a healthcare provider and screening by mammography. In developed countries, the standard of care demands that mammography should be available for all females over the age of 40 years. Mass population mammography has implications for funding, equipment and staffing. In Pakistan, with approximately 20 mammography machines centred on urban sites and on an average, one district radiologist, this is not a practically feasible approach. In addition, costs involved with setting up of

Population screening for cervical cancers is not feasible in Pakistan

mammography units and the staffing implications, when compared with other urgent needs relating to the prevention and control of NCDs, indicate that this will not be a likely possibility within the foreseeable future. If Pakistan's health sector ever evolves into a *high resource situation*, the feasibility of this ideal approach could then be evaluated. However, awareness needs to be created to ensure that the high-risk group inclusive of those with a personal or a family history of breast cancer, post-menopausal diffuse, nodular density on mammography, previous atypical ductal or lobular hyperplasia and a personal history of previous high dose chest radiation are screened on a regular basis by mammography, as recommended.

The behavioural change communication strategy needs to focus on creating awareness about breast self-examination. Although evidence does not exist for survival advantage with breast self-examination, it is, nevertheless, the most cost-effective measure in terms of down-staging breast cancers at diagnosis.[223,224] This approach should, therefore, be actively advocated through the media and in other appropriate settings. In addition, guidance must be provided to all categories of healthcare providers through the NCD training packages referred to in Section 2.

The Pakistan National Cancer Control Project initiated by the WHO focal person on cancer, has outlined a series of guidelines for breast cancer screening.[225] However, these guidelines need to be revisited in light of the consensus summarized in the above section. In addition, the age limit for screening defined in these guidelines will have to be redefined in view of evidence that shows an early age of onset of breast cancer in Pakistan. In addition, research is warranted to identify factors that lead to onset of breast cancer at a younger age.

7.4.4.b Cervical cancers: according to the recommendations of WHO's National Cancer Control Programme, Pakistan categorizes more closely with the 'low level of resources situation: scenario A' with regard to cervical cancers. Population screening for cervical cancers is, therefore, not recommended in our setting. In addition, our Muslim faith abhors practices that are contributory to the risk of cervical cancer.

The standard of care on cervical cancer screening demands that all sexually active women in a population be screened for cervical cancer, ideally by annual PAP smears. The National Cancer Control Project in Pakistan has issued guidelines on cancer screening for the general population. These recommend annual screening for all married women and women above the age of 25 by visual inspection of the cervix if facilities for a PAP smear are available and PAP smears every three years thereafter. The recommendations outline that if three consecutive PAP smears are normal, screening can be done after every five years. Whereas these recommendations are technically sound, there are issues with their application in our setting. Firstly, the recommendation of examining every female over the age of 25 is impractical and unnecessary in our culture. Secondly, only a minority of the public and private sector facilities offer PAP smear on a regular basis and we have no data to report on physician practices. Furthermore, although healthcare facilities in Pakistan are generally equipped with microscopes, it has been observed that only a few of these are in functional order. There are only a

In Pakistan, there are an estimated 30,000 new cases of head and neck tumours annually

handful of trained cytotechnologists and a few pathologists with training in cytopathology in this country. Consequently, Pakistan neither has the resources nor the capacity within the health system to organize and sustain a screening programme of this nature. PAP smears are, therefore, relevant to tertiary care and selected secondary care settings where the necessary infrastructure and expertise is available to perform these. Within these settings, efforts should be made to create awareness among practicing physicians, particularly among gynecologists, to utilize every relevant opportunity to perform PAP smears on females.

Visual examination per speculum could be more widely applicable compared with PAP smears. A number of studies from India, where carcinoma of the cervix is much more common, have reported that naked eye observation and iodine painting, as a first step towards picking out potential cases of carcinoma cervix, is cost-effective. A recent study from Bangladesh has shown that in cases identified by naked eye examination, an additional test of antibodies against HPV16/18 could identify cancer cases. However, given that 80% of the deliveries are conducted at home by Traditional Birth Attendants (TBAs), the application of this approach is also limited. However, gynaecologists, female doctors and paramedical staff coming in contact with women of childbearing age could be targeted to step up practices relating to visual inspection the cervix as part of the pelvic examination in general and antenatal examination in particular.

Before one can assess the case for or against cervical cancer, an effort should be made to generate epidemiological data on the subject. Screening of lower risk women at excessively high frequencies must be avoided at all costs. The challenge is to identify high-risk populations. The *high-risk group* for cervical cancer may not necessarily be the same as in western settings, given the cultural and religious differences and, therefore, needs to be defined in the Pakistani context. This will allow early detection efforts in the future to be targeted more specifically to those at high risk of developing cervical cancer. It is more realistic and effective to screen high-risk women once or twice during their lifetime using a high sensitivity test with an emphasis on high coverage of the targeted population.[226]

7.4.4.c Cancer of the colo-rectum: an estimated 8,400 new cases of colorectal cancer are diagnosed on an annual basis in Pakistan.[205] The standard of care relating to colorectal cancer screening demands that population screening should begin at the age of 50 and should be conducted annually by digital rectal examination and faecal occult blood screening; flexible sigmoidoscopy is recommended at five-yearly intervals.

However, in our setting, there are issues with all the above-mentioned approaches as it has implications for the availability of equipment, infrastructure and trained personnel. In Pakistan, there are approximately 50 gastroenterology units with expertise to perform sigmoidoscopy. Even digital rectal examination cannot be routinely advocated for all individuals over the age of 50 as healthcare providers have limited capacity to perform and interpret the result; in addition, there are cultural issues relating to awareness about the need to perform it. Moreover, the heavy turnover in clinics and the lack of privacy to perform such a test makes it impractical.

The public health response to screening of colorectal cancer in the foreseeable future will have to rest with early detection through symptom recognition. However, as in the former two cases, efforts should be made to create awareness among healthcare providers about the need to include this as a standard practice wherever resources, environment and expertise permit.

7.4.4.d Head and neck tumours: in Pakistan, there are an estimated 30,000 new cases of head and neck tumours annually.[205] The standard of care demands that healthcare providers should take every opportunity to examine for cancers which may be apparent in these areas, particularly in high-risk cases. In addition, individuals should be taught to seek help for any suspicious lesions, especially in the mouth. This approach should target high-risk cases, inclusive of those that chew tobacco. The preventive approach to tobacco use advocates for complete tobacco cessation; however, for those who continue to use tobacco, self-examination for suspicious lesions is crucial.

7.4.4.e Prostate cancer: there are an estimated 11,000 new cases of prostrate cancer every year in Pakistan.[205] The standard of care in the developed world demands that screening for prostate cancer should be carried out on an annual basis through digital rectal examination in all men above the age of 50 years.[227] However, due to issues that have been discussed in the section on colorectal cancer, this is not a feasible approach. In the USA, it is standard practice to perform PSA on an annual basis; PSA screening, however, has not shown to have any survival benefit. Population-wide screening for prostate cancer is, therefore, not recommended. Identification of the high-risk group helps to screen those in whom the chances of developing prostate cancer are highest. The risk of prostate cancer is known to increase after the age of 65 years in those with a family history and among those having an environmental or occupational exposure to cadmium. High-risk screening should, therefore, be focused in these groups. Priming general surgeons and urologists to this approach is the key to stepping up high-risk screening for prostate cancer through digital rectal examinations and histological screening of prostates removed. It is important to develop targeted messages for this purpose.

7.4.4.f Hepatoma: the preventable risks to hepatoma are alcohol and hepatitis B infection. The prevention and control aspects of hepatoma arising as a result of hepatitis B infection are of a cross-cutting nature and can be divided into two broad categories; prevention of hepatitis B infection and prevention of occurrence of hepatoma once hepatitis B is established. The Ministry of Health has recently included hepatitis B vaccination in the Expanded Programme for Immunization (EPI). To meet the increasing demands for the vaccine, local production has been licensed, which is likely to impact retail price favourably. Active collaboration and ethical linkages with stakeholders, such as those with Safe Injection Global Network (SIGN) can enable the stepping up of health education efforts in this connection.[228]

A routine effective screening test for hepatocellular cancer has not yet been developed.[229] However, once hepatitis B is established, the patient is at higher risk of developing hepatoma, which rises further with the onset of cirrhosis. Once cirrhosis is established, regular screening by ultrasound is

recommended since that will enable early diagnosis of hepatoma. When alpha fetoprotein increases, there is no survival benefit in interventions and, therefore, this has not been recommended as a screening modality.

7.4.4.g Gall bladder: the south Asian population is more susceptible to gall stone formation.[230] They have one of the highest rates in the world. Gall stones are a causal association for cancer of the gall bladder and amenable to surgical intervention. It may, therefore, be worthwhile to explore genetic susceptibility through appropriately structured studies.

This section has reviewed current epidemiological data on cancer and the existing on ground programmes relating to their prevention, control and health promotion outlining their strengths and weaknesses. Based on this information, a strategy has been devised to guide future efforts aimed at cancer prevention and control in Pakistan. The Action Agenda items as part of this strategy have been listed below. However, as part of the **Integrated Framework for Action**, cancers have been grouped alongside other NCDs in an integrated model which combines a range of interventions and actions across other NCD domains.

7.5 Cancer - Action Agenda

- ✍ Provide sustainable institutional support for mature cancer registries as a priority to facilitate continuous monitoring of cancers; extrapolate to comparable populations.✝
- ✍ Establish cancer registries in areas that centre on representative population.
- ✍ Preventions of cancers and early detection should feature prominently on the comprehensive NCD behavioural communication strategy.✝
- ✍ Establish a national Cancer Control Council which should be given the mandate of upholding ethics and principles and guidelines on technical matters.
- ✍ Conduct studies to bridge gaps in evidence relating to appropriate and cost-effective strategies for preventing common cancers.
- ✍ Institute proactive measures to contain potential risks to cancers in industrial settings.
- ✍ Ensure transparent enforcement of National Environmental Quality Standards in industrial settings.✝
- ✍ Identify causal associations of risk factors with cancers in the native Pakistani worksite setting to enable the delineation of precise targets for preventive interventions.
- ✍ Invest in educating healthcare providers in worksites to observe safety standards.✝
- ✍ Build capacity of health systems in support of cancer prevention and control. Integrate public health programme monitoring and evaluation with NCD surveillance.✝
- ✍ Prioritize pain relief and palliative care alongside prevention and control efforts.✝
- ✍ Integrate guidance on preventing cancers and early detection into health services as part of as part of a comprehensive and sustainable, scientifically valid, culturally appropriate and resource-sensitive CME program for all categories of healthcare providers.
- ✍ Build a coalition or network of organizations at the national, provincial and local levels facilitated by federal and provincial health services to add momentum to cancer prevention and control as part of a comprehensive effort for the prevention of NCDs.

✝ **Priority Action Areas**
Priorities within other Action Areas will be determined subsequently

8

Injuries

Injuries are predictable and preventable

8.1 Context

The prevention and control of injuries was recognized as an area for investment in the 1997 Health Policy of Pakistan and the 9th Five-Year Plan; however, this policy commitment could not be translated into a concerted public health course of action. Ironically, injury prevention and control has been omitted entirely from within the framework of the current Health Policy of Pakistan 2001.

Injuries result in major economic loss to nations while inflicting a tremendous personal burden on the victims and their families.[231,232] About five million people are estimated to have died of injuries in the year 1990, accounting for 9% of the global deaths; more than 90% of these occurred in low- and middle-income countries.[4] It is projected that motor vehicle crashes (road accidents) will be ranked third worldwide and second in the developing countries in order of disease burden in the year 2020 compared with their present ranking at number nine. A recent World Bank report identified south Asia as the region with the greatest projected increase in road traffic injuries over the next 20 years.[233] The study predicts that it will take about 40 years before a decline in road injuries is expected in the region unless steps are taken now to improve road safety.

Injuries have traditionally been regarded as random, unavoidable *accidents*; however, with improved understanding of the underlying reasons and nature of injuries, we now know that injuries, like other diseases, tend to affect identifiable high-risk groups and follow a predictable chain of events. Interventions among high-risk groups can, therefore, prevent injuries. Experiences in high-income countries attest to this fact. For example, in USA, injury prevention strategies account for two of the 10 most successful public health interventions of the last century. Seatbelt use alone has saved more than 147,000 lives in that country from 1975-2001.[234] In injury literature, therefore, the use of the word *accident* is discouraged.[235] For the purpose of this document, therefore, the expression 'road traffic crash' (RTC) will be used for what is generally referred to as a road traffic accident. In cases where prevention fails, mortality and morbidity can be minimized by providing optimal acute care and rehabilitation.

8.2 Data on injuries in Pakistan

Over the past 10 years, multiple studies including a national survey have been published in international literature. These studies have highlighted the public health importance of injuries, identified major risk factors for injuries and looked at gaps in the various data systems. A few studies have attempted to

About 25% of the emergency room visits in hospitals are related to injuries

describe the behavioural determinants of road traffic injuries. However, in-depth prevention-friendly data are still hard to find and intervention trials for injury prevention are non-existent.

A literature review carried out in the late 90s reviewed the types of injuries occurring in Pakistan. The study reported that motor vehicle injuries, homicides, assaults, work-related injuries, poisonings and firearm injuries were the predominant forms of injuries occurring in the country.[236] In addition, the study reported lack of reliable data and under-reporting of work-related injuries and suggested that Pakistan must institute an information system to monitor trends in injuries, evaluate their true impact and develop national safety standards.

The National Injury Survey of Pakistan was conducted in 1997.[237] This was a retrospective survey based on self-reporting of injuries among a representative sample of 1539 households; the survey described injuries in terms of morbidity, mortality and disability. The incidence of serious injuries was reported at 41.2 per 1000 persons per year.[238] Transport-related injuries were the most common cause (36%), followed by exposure to inanimate mechanical forces (28%), falls (23%), intentional self-harm, interpersonal violence, injuries due to smoke inhalation, burns, exposure to electrical current, extreme ambient temperature and radiations as well as envenomation and injuries to patients due to medical/surgical errors. Exposure to inanimate mechanical forces was caused by agricultural machinery, non-powered hand tools and injuries as a result of situations in which a body part was caught, crushed or pinched between objects. Thirty six percent of the total injuries were sustained on roads and on roadsides, 34% had occurred at home, 7.3% at farming sites, 5% in playgrounds, 2.3% in schools, 4.7% at worksites, 4% in offices or shops and 6.7% in other places.

Table 8.1 Distribution of injuries by causes*

Cause	Injuries (%)
Transport	36.3
Exposure to inanimate objects	28
Falls	23
Exposure to animate objects	3
Violence	2.3
Others	8.4

* National Injury Survey of Pakistan 1997

In another population-based study carried out in the rural Northern Areas of Pakistan,[239] falls, burns and RTCs were identified as the commonest causes of injuries; burns being the most common injury among women and in children less than five years of age. The incidence of morbidity and mortality due to injuries in that population was 1531 and 59 per 100,000 persons per year, respectively. A retrospective study (based on verbal autopsy) conducted to assess cause-specific mortality rate among the urban poor of Karachi identified injuries as a cause of death in 15% of the patients. Of note, road traffic injuries were the third most common cause of death among men (after

Motor vehicle crashes are the commonest cause of injuries in Pakistan

circulatory disorders and TB) while burns were the fourth leading cause of death among women (after circulatory disorders, maternal causes and tuberculosis).[240,241]

Another study based on ambulance data in Karachi defined the epidemiology of violent/intentional injuries in Karachi. According to the study, the ambulance service transported 4091 intentionally injured persons during the 29-month period from October 1993 to January 1996. Ninety-five percent were males; 74% were 20 to 40 years of age 58% died before reaching the hospital. Firearms were the most common mode of injury (83%).[242]

A study looking at causes of childhood injuries (age = 15 years) identified motor vehicle crashes as the most common cause of injuries (80%), followed by falls (5%), burns (5%) and drowning (3%). A significant number of injured children (15%) died either at the scene of the accident or during transportation to the hospital. Large vehicles (buses, minibuses and trucks) were involved in 54% of these childhood road traffic injuries. Almost one-third (33%) of the burns took place in the kitchen at home, and half (51%) of all drowning cases occurred in the sea. The study concluded that a majority of the children transported by ambulance service were pedestrian victims of RTCs. Prevention efforts aimed at stricter enforcement of driving laws and family/child education geared towards pedestrian safety could potentially reduce morbidity and mortality.[243]

Pedestrian behaviours with respect to RTCs have been studied in the city of Karachi.[244] The investigators selected 10 of Karachi's highest-risk locations for pedestrian RTCs and observed 250 pedestrians for each of three activities – crossing the street, walking on the street, and walking on the sidewalk. They concluded that pedestrians in Karachi take identifiable risks while crossing a road/street. Some of these behaviours are compounded by encroachments on streets and sidewalks.

Large commercial vehicles account for a disproportionate number of road traffic accident fatalities in Karachi. A study done in Karachi evaluated the potentially dangerous bus driving and commuting practices that increase the risk of road accidents and the effect of traffic police on such practices.[245] The study showed that of the disembarking passengers, a third did not wait for the bus to stop, more than half stepped off in the centre of the road and 84% did not look out for traffic. Among the embarking commuters, more than a third got on moving buses, while two-thirds climbed on buses packed to their outer foot boards. At the bus stops, 30% of the buses did not stop completely, 46% stopped away from the stop and 79% stopped in the centre of the road. Where traffic police were present, buses were more likely to race and to cut off other vehicles than where police were absent. The study concluded that risky behaviour is common among both Karachi bus drivers and bus commuters and that traditional efforts to regulate bus traffic through traffic police are ineffective.

Facility-based studies conducted in Pakistan have also shown that about 25% of the emergency room visits in hospitals are related to injuries, whereas one-third of the surgical beds and almost 50% of the neurosurgical beds in tertiary care facilities are occupied by patients who have sustained injuries.[246]

In the year 1999, there were around 1.4 million road traffic crashes in Pakistan; of these, 7000 resulted in fatalities

These studies present a convincing argument in favour of making injury prevention and treatment a public health priority. In this regard, many interventions are available and easy to implement. For others, there is a need to know more. In addition, more in-depth studies need to be done in the area of establishing the 'intent' of an injury event. None of the studies carried out thus far, including the National Injury Survey, has evaluated this perspective. Many injuries, especially those caused by falls, firearms, electrocution and burns could well be an act of violence and, therefore, basing public health interventions on the assumption that these events are invariably unintentional will not address the key causal factors that are, nevertheless, amenable to preventive interventions.

Injury surveillance is a key component of an injury prevention programme. Surveillance of injuries must be integrated with a comprehensive population-based NCD surveillance system. Population data can be supplemented by multiple data sources (facility-based data, reliable police and newspaper reports and data from other appropriate sources).

The following section deals with a review of the situation as it relates to injury prevention and control in Pakistan with a view to identifying gaps that have implications for public health interventions; within this framework, injuries have been classified into RTCs, occupational injuries, falls and interpersonal violence. The discussion on RTCs is relatively more detailed as they are the main contributor to the burden of injuries in addition to being relatively better studied in this grouping.

8.3 Road Traffic Crashes

With an estimated annual occurrence of 10 million worldwide,[247] RTCs are the leading cause of death in adolescents and young adults in the world. The World Health Organization has undertaken measures to highlight the magnitude of this burden with two major events in the year 2004. The first involves dedicating the theme of the World Health Day 2004, to road traffic injuries and measures to prevent them by using the slogan 'Road Safety Is No Accident,' whereas the second involved launching of the first global review of the issue in the 'World Report on Road Traffic Injury Prevention'.

8.3.1 Burden of RTCs in Pakistan

In Pakistan, the Road Traffic Injury Study,[248] compared available data over the last 42 years (1956-1997) – the overall incidence of RTCs was 15 per 1000 persons per year. This study was based on assessment of various sources of data – police records and information from other government agencies being the main sources. The National Transport Research Centre (NTRC), Pakistan Motorway Police, Federal Police Research Bureau, in-depth interviews with survivors of RTCs and focus group discussions were other data sources.

The study showed that injuries were most frequent among occupants of motor vehicles; however, in contrast, fatalities were commoner among pedestrians. Speeding was identified as the leading cause of RTCs in Pakistan; other causal factors included rash driving, long duty hours on vehicles for drivers, absence or inappropriate display of diversion signs and deficiencies in the policing system. This study measured the fatality risk, defined as the number

of deaths in road crashes per 100,000 persons, in a specific time period. Between 1956 and 1997, this had increased five-fold. The Road Traffic Injury Study showed that the police under-report 18% of the road traffic fatalities and 72% of the road traffic injuries. This implies that police data collection needs to be improved and strengthened by verification through other supplementary sources of information.

The National Transport Research Centre has been involved in several research studies over the last decade in an attempt to illustrate the overall burden of RTCs in Pakistan and to identify potential causes of such crashes. Research in collaboration with Finnroad OY,[xvi] Finland, has also recognized that estimation of RTCs based on police records is likely to be an under-estimation because of inherent systems and practices within the police reporting system that lead to under-reporting of RTCs. The police report an accident only when a fatality has occurred; this results in under-estimation of crashes. Finnroad OY reported that less than 10% of the RTCs are reported.[10] This trend has been corroborated by another study done in Karachi looking at the under-reporting of severe road traffic injuries in the traffic police-based data system. Using capture recapture method, the investigators estimated that while police records identified a large number of deaths (56%), most of the severe injuries (18 out of 19) remained unaccounted for.[241] This also results in an over-estimation of fatal crashes. This is evidenced by a reported fatal accident ratio of 40% for Pakistan in the same study. The National Transport Research Centre reports a fatal rate of 28% based on its independent assessments. Clearly, this trend in reporting of fatal accidents seems to be falsely high when compared with data from other parts of the world which averages around 3%.[249]

In view of the afore-mentioned considerations, plausible projections on the burden of RTCs in Pakistan have, therefore, been drawn from other sources. An analysis extrapolated results of several regional studies and accommodated reasonable inferences based on police records for the year 1999. These projections highlighted the magnitude of the burden of injuries for the year 1999, estimating that within that period, there were around 1.4 million RTCs in Pakistan; of these, 7000 resulted in fatalities.[10]

Facility-based data show that RTCs contribute significantly to workload in hospitals. Road traffic crashes are the commonest cause of head trauma. Mild, moderate and severe head injury has been observed in 52%, 30% and 18% of patients respectively, in various neurosurgical centres over a period of four years.[250]

Several factors contribute to the occurrence of RTCs; among these are factors relating to the user, inclusive of the driver, pedestrian and passenger; contributory causes that relate to the vehicle in terms of its design, fitness and loading and factors inherent to the road itself such as infrastructure and road furniture. Case studies carried out by NTRC provide useful insights into the dynamics of these crashes.

[xvi] Finland-based international road design and safety consultants; member of the International Road Federation.

8.3.2 Road user

Behaviours of pedestrians and users of vehicles (both drivers and passengers) are crucial factors in RTCs and can play an important role in their prevention. In Pakistan, as in other developing countries, victims of RTCs are generally people from the lower socio-economic class. The term 'vulnerable road users', which is used to describe these high-risk groups, includes pedestrians, passengers/drivers of commercial vehicles and passengers of smaller vehicles like motorcycles and bicycles. Majority of fatalities in RTCs in Pakistan are caused by buses and trucks.[251,252] Competency of truck and bus drivers, their awareness and compliance with road traffic regulations and the incentive structure that encourages them to speed is, therefore, an important issue. It is imperative to ensure that high-risk drivers are capable of protecting their own lives and the lives of others; for this purpose, adequate training and subsequent licensing through a transparent mechanism is essential. This has to be supplemented by a fair, just and transparent traffic regulatory code of conduct.

These issues notwithstanding, structural changes can be introduced to improve the existing training and licensing systems. Most driver training schools are known to be within the private sector. For example, within the district of Rawalpindi, there is only one driver training school in the public sector with a capacity to train 23 students per month; on the other hand, 100-150 driving licenses are issued within a month in Rawalpindi. Clearly, a major contribution is made by private sector schools, of which there are around 70 in the city of Rawalpindi alone. Appropriate regulatory measures need to be developed and implemented for such institutes. The enforcement of such regulations will have to begin with registration of training institutes.

There is great potential in enhancing the awareness level of drivers, pedestrians and passengers about the benefits of adopting safe road traffic practices. This can be achieved through a well-structured behavioural change intervention that targets all those on the road, particularly the high-risk group, through a multi-media strategy. Experiences in the developed countries have shown that some of these interventions are highly successful in terms of saving lives. Seatbelt legislation and its successful enforcement is known to have saved an estimated 112,000 lives in USA over a three-year period. However, the use of seatbelts in all vehicles is unlikely to be effective unless one can mandate their use in conjunction with penalties for non-use. Moreover, it has been shown that other public health interventions such as Zebra Crossings, health education, penalties, cameras for speed limit,[253] helmets for those on motorbikes and cycles, and adequate fencing around roads to limit trespassing have resulted in significant public health gains.[254] Given the high incidence of head injuries, motorcycle and bicycle helmet laws should strictly be enforced. A standard should be stipulated for the designs of helmets to avoid the fiasco currently seen in cities like New Delhi, where flimsy helmets are often used to comply with legislation.

The Health Education Department of the Government of Pakistan does not have an allocation for RTC prevention. Several private sector initiatives are contributing to road safety, albeit in a defined population and within major

cities. The Pakistan State Oil (PSO) in collaboration with 3M,[xvii] has recently established a partnership with city municipalities of Islamabad, Lahore, and Karachi with the overall objective of improving road signage and markings. Toyota has visibly been disseminating public service messages, through newspapers, to promote seatbelt use on the roads. Every effort should be made to support such initiatives within an ethical and appropriate public-private partnership framework.

Other private sector initiatives, such as those undertaken by Shell, are also aimed at improving road safety. They target company employees and are in compliance with the company's safety stipulations. Such methodologies structured for defined populations could be of use, once modified for a larger audience. Their potential for replication and within that framework, the role of the non-profit private sector, should be explored. Some NGOs such as the Association of Road Users of Pakistan (ARUP), the Traffic Safety Council of Pakistan and others can play a useful role in this connection. There is also a need to introduce prevention strategies into the primary and secondary school systems. These include bicycle safety, pedestrian safety and education of drivers.

Several traffic black spots have been identified along highways

Road safety needs to be tabled prominently on the health education and health promotion agenda. A multi-sectoral approach through the involvement of all stakeholders can maximize the impact of this intervention.

8.3.3 Roads

A high proportion of RTCs in Pakistan occur on major intercity trunk roads. Studies conducted in Punjab have revealed that 27% of the total fatal crashes occur on N-5.[xviii,255] However, there are no studies, which compare prevalence and dynamics of RTCs between cities and highways. Such information needs to be generated as it is critical to the development of preventive measures suited to each setting.

Pakistan's modest network of highways includes 17 major highways with a total mileage of 8845 kilometres spanning four provinces. The turnover on these highways varies; from an average of 2450 vehicles (Taxila toll data) and 12,589 (Jhelum toll data) to 36,560 vehicles (Ravi toll data).[256] Recent efforts aimed at improving the safety and administrative standards on major highways has resulted in the establishment of an efficient electronic data collection system. This database has enabled an assessment of high turnover and high-risk highways with considerable precision.

8.3.3.a Road construction and furniture: flaws with road construction, maintenance and road furniture are an important contributory factor to RTCs. The Lahore-Rawalpindi Motorway segment passing through the salt range is an example. Soon after its completion in 1997, the number of crashes on M2 in that particular segment rose dramatically owing to the sharp bends and curves and steep inclines of the Motorway as it cuts through the salt range. The speed limit in that section had to be dropped from the originally defined 100 kilometres per hour, eventually to 25 kilometres per hour before a decline in the crash rate was observed.

[xvii] International traffic signs and road marking contractors.
[xviii] Lahore-Peshawar Grand Trunk Road.

Examples from two other resistant trouble spots also help to substantiate that road design has a major part to play in the dynamics of RTCs. Several traffic black spots have been identified along Pakistan's highways. Two of the most notorious amongst these are the Mansoor Bend, located at a distance of 100 kilometres from Islamabad on N-5 and the Bakrala Bend situated in proximity to Gujar Khan on N-5. These black spots were accountable for a significant number of fatal accidents on corresponding highways.[257] To address this issue, the National Logistics Cell (NLC),[xix] and the National Highway Authority (NHA) conducted a major intervention, as part of which road signage around bends was considerably improved and cat's eyes, chevrons and road markings were installed. These measures decreased the incidence of RTCs; prior to this intervention, 18 fatal crashes had been reported over a one-year period (2001-2002) from Bakrala and Mansoor Bend sites. These resulted in 59 fatalities and left 93 injured at the time of the crash. Subsequent to the intervention, the number of accidents within a year (2002-2003) fell from 18 to three, whereas there were only two fatalities (inclusive of one pedestrian); eight individuals were injured as a result of these crashes.[258] Every effort should be made to identify other black spots and to implement appropriate safely measures in such settings.

There have also been anecdotal reports of barriers on roads causing crashes; these are usually temporarily installed by the general police force for security monitoring. However, the magnitude of this issue has not been quantified. In addition, no guidelines have been issued to the police relating to the use of this apparatus in heavy traffic turnover sites, and no safety standards stipulated, in this regard. Barriers need to be replaced by police posts in key sites; where their installation is mandatory, guidelines for safe installation should be issued.

The above-mentioned discussion related principally to highways. However, within cities, the most commonly injured victims are pedestrians; in this context, the road design needs to consider two things namely, separation of pedestrians from traffic and traffic calming measures. Work done in other parts of the world has shown that designating *pedestrian only* areas and streets, widening of sidewalks, as well as removal of encroachments from sidewalks to facilitate walking can reduce injuries. Pedestrian training through educational sessions at schools and colleges could inculcate safe walking practices at younger age. Area-wide traffic calming measures aimed at controlling the maximum speed through frequent traffic signals, roundabouts etc., have been found to reduce the injury rates and must be promoted.

8.3.4 Vehicle

8.3.4.a Vehicle overloading: vehicles, especially heavy vehicles, are a contributing factor for RTCs in Pakistan – particularly relevant to our setting is vehicle overloading and vehicle design. Both passenger and cargo load can contribute to overloading. Passenger overloading, commonly observed during rush hours, makes passengers vulnerable to being injured. The solution to this issue rests with making public transport more accessible and widely

[xix] A public sector transport agency.

available. Detailed discussion on this aspect falls outside the scope of this document.

Cargo overloading damages roads, making them unsafe for driving. This issue cannot be addressed in the absence of tough legislation enforced by strict and transparent regulatory mechanisms. Legislative measures within this framework have been referred to in a subsequent section. With the National Highway and Motorway Police (NH&MP) patrolling major highways, it is expected that there will be stricter enforcement of such regulations. Also crucial to this is the availability of the infrastructure necessary to weigh and measure and anticipate the loaded weight on vehicles. In Pakistan, several vehicle cargo weighing stations situated at different locations along main highways are capable of serving this purpose. A review of their locations reveals that eight,[xx] weighing stations are currently operational whereas another eight,[xxi] are expected to be operational soon. As is evident from the locations and their coverage, these stations are inadequate to cater to the needs of the heavy traffic turnover. An assessment needs to be made of the capacity of existing stations to meet the expected needs and the public health potential of up-scaling this capacity.

Vehicle design is another contributory factor to RTCs

8.3.4.b Vehicle design: the design of the vehicle is another contributory factor to RTCs. Company-built designs are usually safe and the law protects them from being altered. The major issue in this context pertains to locally manufactured vehicles, which usually do not conform to safety standards. Manufacturing of such vehicles involves inappropriate use of cast iron with sharp contours, large hoods, bumpers and jutting projections; such features make the vehicle dangerous on impact. In addition, poor quality of cast iron used for the outer structure makes the vehicle more vulnerable to collapse on impact. Local small production units are not covered under any law such as the Factory Act of 1934 governing industrial units; they are, therefore, outside the jurisdiction of the legal framework. It is imperative, therefore, that the design of locally manufactured vehicles should be regulated by law and patented, its quality assured and passenger safety and crash prevention be paramount while deciding on these factors.

It is known that the introduction of safety features in automobile design (laminated windshields, collapsible steering columns, interior padding, lap and shoulder belts, side marker lights, head restraints, leak resistant fuel system, increased side door strength, better brakes and airbags) helps reduce vehicle crash fatality rate (per kilometres travelled) by 40%. Only three of these innovations are known to have added less than $10 to the price of a car.[259] The design of locally manufactured vehicles needs to be improved in order to make them safer on the roads. However, in doing so, locally tailored safety features need to be developed. Making seatbelts mandatory on all vehicles can significantly improve the safety of car passengers and must be promoted.

[xx] Noshki, Nokundi and Lakhpass (Baluchistan); Kohat Tunnel (N.W.F.P); Gaddani, Steel Mill and Sukkur Bypass (Sindh); Sangjani (Punjab) and one portable weighing station.
[xxi] Attock Bridge, Aimenabad and Pattoki (Punjab); Rohri Bypass, Super Highway Toll Plaza, Bulhari and Ranipur (Sindh); and Kohat Tunnel (NWFP). South Portal is expected to be operational soon.

In the urban areas, where many crashes are caused by passengers falling off from moving vehicles, injuries can be prevented by mandatory door closing policy for commercial vehicles.

8.3.5 Legislative measures

Although the National Highway Safety Ordinance (NHSO) 2000,[260] has been promulgated with effect from September 2000, neither have rules been formulated to guide its enforcement nor have the provincial Ordinances been upgraded. The Ordinance is, therefore, being implemented in a very rudimentary sense with questionable validity. Only traffic law enforcement by NH&MP on selected major highways and motorways is currently being carried out as per the stipulations of the Ordinance. Traffic on highways not being patrolled by the NH&MP, the within-city traffic, licensing, registration and vehicle fitness, and construction and maintenance are still being carried out under the Motor Vehicle Ordinance 1965. Even if the rules of NHSO 2000 were to be developed and fully implemented, its impact would remain limited as this Ordinance has been designed for NH&MP in particular, and will, at best, be relevant to major highways and motorways only. It is, therefore, important to upgrade the Motor Vehicle Ordinance (MVO) 1965.

The Motor Vehicle Ordinance has several limitations; the law fails to adequately address the issues of licensing, point violations and ticketing systems, speed limits and major violation punishments. In addition, the parameters of vehicle design and construction, and the standardization of road signs and road furniture have not been adequately stipulated. Most of these weaknesses have been addressed as part of NHSO 2000. However, in both cases, the law does not provide any protection to those involved in evacuation of accident victims. Furthermore, inadequate compensation has been provided to accident victims under MVO 1965; this was subsequently addressed through an amendment of the Ordinance as part of which the scale of compensation payable on death or injury was revised.

8.3.6 Enforcement of rules and standards – policing

Rules of the NHSO 2000 have not been developed

Prior to 1997, the deployment of police force on major highways was insufficient. One police officer was assigned to cover an area of 100 kilometres. In addition, this force was not adequately mobile, as a result of which their function, by default, was reduced to one-point monitoring rather than patrolling – a function key to enforcing traffic regulations with implications for prevention of injuries. For the same reason, arrival at the site of a crash to facilitate passenger recovery was delayed for hours. In addition, insufficient incentives were an impediment to the motivational aspect.

In 1997, the Pakistan Motorway Police came into existence; the development of this modern police highway patrol force coincided with opening of the M2 Motorway.[xxii] This modern fleet improved the standards of care on major highways, albeit at a high cost. However, it was also realized that this system could be made sustainable by instituting organized procedures that centred on the collection of toll on major highways. This realisation culminated in re-structuring of the Pakistan Motorway Police and its evolution into the

[xxii] Motorway between Islamabad and Lahore.

NH&MP has improved the patrolling situation on selected highways

National Highway and Motorway Police (NH&MP) in February 2001. Over a period of two years starting from June 2001, NH&MP was handed over five new motorways/highways,[xxiii] as a result of which it now controls 25% of the motorway and highway mileage in Pakistan.

The new national highway and motorway trafficking system is more organized and seems more effective compared with the previous arrangement with regular traffic police. Adequate staff is deployed to cover a smaller highway segment; these deployments are for a shorter duration and a fair incentive and reward is packaged for officers. Compared with earlier practices where one officer was deployed to take charge of an area spanning 100 kilometres with one vehicle at his disposal, working on a 12-hour shift, NH&MP deploys four motor vehicles, four police officers, one supervisor on the wheels and two motorbikes for every 40-kilometre *beat* in an eight-hour shift. This system is sustainable, despite the incurrence of substantial administrative costs as it uses toll collection to generate revenue. However, the impact of this intervention in terms of reduction in RTC-related mortality and morbidity has not been assessed comprehensively; this would have enabled a more tangible comparison of the costs per life saved. Such assessments in the future are likely to be complicated by the previous trend of under-reporting of RTCs. This has resulted in an apparent increase in reporting of crashes since NH&MP has taken over. However, preliminary assessments indicate that a significant decrease in the incidence of road traffic mortality and morbidity can be attributable to the institution of this system.[261]

The National Highway and Motorway Police has also developed guidelines and tools to assist drivers and pedestrians. These tools are intended to provide locally relevant guidance and to increase the knowledge level of those on the road with the overall objective of improving safety on roads. However, these tools remain under-utilized. It is important to assess the acceptability and feasibility of utilizing these tools to enhance their use for creating awareness and altering behaviours. Mandatory toll collection at check-points is a useful opportunity to interface with drivers and circulate such materials and handouts.

The National Highway and Motorway Police is also capable of providing emergency services at the roadside; for this purpose, they are provided with mobile first-aid kits and are trained in emergency care settings. However, there needs to be an assessment of the first-aid training given to them. Moreover, the quality of the first-aid assistance that can be provided is not efficient because of the absence of available ambulances and cranes for a given sector, which are essential for speedy evacuation of victims. In addition, an inventory of hospitals and medical service points should be made available to police officers to help them identify the closest point of contact with medical help from a given location.

Whereas there is a general and reasonable impression that NH&MP has improved the patrolling situation on selected highways, Pakistan is far from

[xxiii] Peshawar to Lahore GT Road (N-5); Lahore to Lodhran (N-5); Karachi to Jamshoro and Hala (Super Highway); Rawalpindi to Lahore Motorway (M-2) and Pindi Bhattian to Faisalabad Motorway (M-3).

having achieved the ultimate in highway safety. Precise issues inherent to this police force need to be clearly delineated and addressed. Regular monitoring and evaluation of this force needs to be undertaken from administrative, performance and fiscal perspectives so that its impact *vis a vis* costs incurred can both be justified and maximized. In addition, the public health potential for linking with this network needs to be fully realized so that tangible public health benefits can be achieved by linking with this system. The potential within the existing NH&MP database to serve as an ancillary surveillance mechanism for RTCs needs to be assessed, and if feasible, established. It would be useful, therefore, to have the Ministry of Health and/or its representatives with pubic health experience represented on the governing body and administrative structure of this institution.

The National Highway and Motorway Police serves only 25% of the highways in Pakistan, with 75% still being patrolled by the traditional police force. It can, at best, be stretched to the entire motorway and highway systems in Pakistan; however, there will still be the need to upgrade traffic police systems within cities. It is, therefore, essential to upgrade this system in parallel; such efforts should also be sensitive to training and resource requirements of traffic policing – both in the urban and rural areas.

Ensuring safety on roads is a multidisciplinary challenge with implications at different levels. It is suggested that a committee should be constituted on road safety under a National Safety Commission. This committee must have adequate representation from all stakeholders and should preferably be chaired by individuals with a background in public health and with active representation from the Ministry of Health. The committee should foster a collaborative environment between various stakeholders who can potentially play a part in road safety; this includes the vehicle registration authorities, licensing authorities, Motor Vehicle Examiner, NHA, NH&MP, healthcare system, general public representatives and transporters.

8.4 Occupational injuries

Occupational health is one of the grey areas within the health system in Pakistan. Several factors contribute to occupational injuries, foremost amongst them being lack of recognition of the magnitude of the problem. The prevalence of injuries in workers enrolled in the Social Security System has been reported at 21 per 1000 person years, with a yearly average workday loss of approximately 12 days;[262] the reported incidence is greater than internationally comparable figures.[263]

There are several issues in Pakistan that continue to hamper any efforts towards achieving comprehensive occupational healthcare. Poverty, unemployment and the consequent desperation for a livelihood are issues that often overshadow concerns for safely in an occupational environment at a personal level; this aspect of a worker's limitation is often exploited.

Worksites are important settings for preventive health interventions. These should be instituted in two modes – preventive interventions specific to worksites and those aiming to promote the concept of wellness in general. The former should be designed to mitigate the risk of exposure to hazards that are specific to that worksite; education of workers in safety and training

and encouraging workers to observe safety standards while at work are known to reduce the risk of injury. The latter should incorporate the promotion of healthy lifestyles. In addition, studies should assess the feasibility and applicability of measures that reduce the stress that comes with lack of control over daily tasks and unhealthy physical environments in the Pakistani setting.

One of the effective means of achieving workers safety is through legislation and its enforcement to ensure safe work places. Ironically, there are currently no laws for enforcing occupational health and safely standards within Pakistan. An Ordinance was drafted in 1998 for stipulating safety standards in worksites but was subsequently shelved for reasons beyond the scope of this discussion. It is imperative that such efforts be resumed with the objective of formulating a comprehensive legislative framework in working towards occupational health and safety. Pakistan will also benefit from a national agency such as the Occupational Safety and Health Association (OSHA) to set workplace standards and investigate workplace-related morbidity and mortality events.

8.4.1 Social Security Department

The Social Security System is the only comprehensive health coverage system for the labour workforce in Pakistan even though a number of other institutions under the federal and provincial ministries of Labour are mandated to deal with occupational health. More than 1.2 million individuals come under the Social Security net; however, this represents only 3.06% of the workforce in Pakistan, with the total workforce estimated at 42.75 million.[264] Social security is an organized system in Pakistan with much inherent strength. It has an autonomous system of generating funds for its use, a comprehensive self-owned healthcare infrastructure with a well-structured information system and a demographic database of those secured under its net. However, there are several weaknesses in this system which significantly undermine its impact, and which, if addressed, could enable it to extend its cover in a comprehensive manner to a much larger segment of the workforce.

The Social Security Department must focus on preventive health

The Social Security Department came into existence in 1967 through an ordinance of the Provincial Assembly of West Pakistan. It presently operates in three provinces: Punjab, Sindh and NWFP with the objective of providing healthcare facilities to workers in the private industry. Under the stipulations of the Ordinance, all private notified industrial and commercial establishments with more than 10 employees under a certain salary scale fall within this net; these establishments are liable to make a monthly contribution to the provincial Social Security institution. Owing to the rich contribution of several income sources, Social Security has ample funds. For the year 2001-2002, the yearly income of Punjab Social Security was Rs. 1.3 billion whereas the net profit for that year amounted to 34 million. Through these funds, Social Security provides a range of curative healthcare facilities primarily through its dedicated network of hospitals and dispensaries and medical benefits to those under its cover. Most notable, however, is the lack of focus on preventive healthcare, which should be one of the hallmarks of occupational health.

It has been noted that despite the availability of a comprehensive database of all the secured workers under this scheme, and the potential that exists within that framework to study them as a cohort, no attempt has been made to study the trends of disease within this population. Every effort should be made to study trends so that evidence could be generated for prioritizing public health interventions within appropriate settings. This can also serve as an ideal surveillance mechanism for monitoring trends of work-related injuries and to get insight into the causal factors.

Relevant to the mandate of the present initiative, it needs to be recognized that it provides curative services only; neglecting the preventive and control related aspects of diseases altogether. The system does not integrate the concept of *Wellness in Health*, which underlies the need to work in partnership with individuals in their worksites in order to optimize their health, fitness and quality of life. Integrating health education could be relatively simple in this setting as captured audiences are available. It is imperative to pay careful attention to this missed opportunity.

Clearly, this system needs to be broader-based; in particular, integration with the agriculture sector is crucial, which is where more than 48% of Pakistan's workforce is employed. The NISP reported machine injuries as the second commonest cause of injuries in Pakistan; many of these injuries (28%) were inflicted on agricultural sector workers. However, in contrast, there are no legislative measures applicable to this issue; clearly this gap needs to be bridged.

Instituting measures to broaden the base of Social Security will result in an increase in the number of workers targeted on the one hand, and will achieve the purpose of integrating preventive health with its mandate, on the other. This structure and its applicability is useful not just in the context of work-related injuries but also for the prevention and control of cancers and other diseases that result due to occupational exposure. These have been discussed in Section 7.

Kite flying festivals such as *Basant* are known contributors to injuries in Pakistan

There are several other labour welfare organizations and structures within the country; these include the Employees Old-Age Benefit Institution (EOBI), the Workers Welfare Fund, the National Training Bureau and the Labour Welfare Department whose mandate is to inspect factories to ensure safe working conditions. Despite the existence of such extensive organizations and structures, there are no systems in place to comprehensively address worksite safety. It needs to be recognized that such environments present an opportunity to target a captive audience. Every effort must, therefore, be made to integrate preventive health into the mandates of such organizations.

8.5 Falls

The National Injury Survey of Pakistan has identified falls as being the third commonest cause of injuries in Pakistan, accounting for 23% of the total injury burden. Rooftops, trees and animal backs were identified as being the commonest sites from where falls occurred. Kite flying festivals such as *Basant* are a known contributor to injuries in Pakistan and India.[265] However, this issue has not been quantitatively assessed; in addition to injuries, there are also increased reports of electrocutions during this period due to the use

of metal wires for flying. There is, therefore, the need to enforce strict regulatory measures in this regard.

Unsafe environments within homes are a major cause of falls for the elderly, resulting in fractures in many cases.[266,267] In Pakistan, a further understanding of the causes of falls is warranted to plan appropriate prevention strategies for various age groups, in varying social and geographical groups. Legislation for safe buildings exists in Pakistan. Regulations relating to proper guarding and fencing of rooftops, details relating to the design, height and shape of stairs, and specifications relating to requirements to secure balconies and terraces have been clearly specified. Existing building codes need to have stricter enforcement and implementation.

8.6 Violence

Violence can be categorized into self-harm (suicide/parasuicide), inter-personal violence and collective violence (where one large, organized group attacks another group).[268] All types of violence are common in Pakistan.

According to one estimate, the suicide rate has quadrupled in the past 14 years.[269] Suicide is one of the three leading causes of death among people aged 15-35 of years. There are scant data relating to suicides in Pakistan; however, available evidence suggests that suicide rates may be similar if not higher than the global average. Studies carried out in Pakistan have shown that 54-61% of the patients presenting to hospital emergency departments with acute poisoning and suicidal attempts suffer from psychiatric illnesses; depression and personality disorders are the most common diagnoses among these patients.[270, 271] Studies show that the prevalence of suicide is higher in males with a peak incidence in the 20-29 years of age.[272,273] However, suicidal attempts and ideation are commoner in females compared with males (36% vs. 56%). [274] Measures need to be instituted to collect reliable data, which would serve the basis of developing public health strategies suited for the prevention of suicide.

Similarly, interpersonal violence, especially violence against women, is well known. Among 150 women interviewed at healthcare facilities in Karachi, 34% had been subjected to physical abuse – a strong association between domestic violence and depression has also been demonstrated.[275] In a more recent study conducted in a public sector tertiary hospital in Karachi, 33% of the 70 men interviewed reported 'ever slapping' their wives.[276] Another study showed that the lifetime prevalence of marital physical abuse was 49.4%, in which slapping, hitting or punching was most often reported (47.7%).[277] A report has suggested that in the year 1998-99, more than 99 women were killed in the name of honour killings alone.[278] The NISP reported that between 1994 and 1999, more than 3560 women were hospitalized after being attacked at home with fire, gasoline or acid; however, this represents just the tip of the iceberg.

Child abuse, another form of interpersonal violence, is also common in Pakistan. While parents may think that it is better for the child, overwhelming evidence in literature shows that physical punishment and abuse actually harm the physical and psychological wellbeing of a child. A study looking at this trend in Karachi's schools found that 70% of the children had been

Between 1994 and 1999, more than 3560 women were hospitalized after being attacked at home with fire, gasoline or acid

physically abused by their parents in the year prior to the interview; being slapped (67%) was the most common form of physical abuse, followed by hitting with a shoe (13%), throwing an object (11%), pushing or shoving (11%), hitting with a stick (9%) and choking (3%). Interestingly, men who physically abuse their wives were six times more likely to abuse their children.

There is anecdotal data on abuse of the elderly; the underprivileged in a household are also victims to this trend. The definition of this can be expanded in Pakistan's context to include domestic and worksite help. Non-domestic interpersonal violence is also common in Pakistan. Violence of one political group versus another or one tribe versus another is well known. However, the exact magnitude of the burden needs to be determined.

Many NGOs are working in this area, largely with the aim of creating awareness relating to the magnitude of this issue and providing assistance to those who suffer at the hands of domestic violence. The roots of this problem are embedded in the complex interplay of cultural and social factors and at times, stem from misinterpretations of religious teachings and cultural norms.

Several strategies can be instituted for addressing this issue. The World Report on Violence published by WHO discusses these in detail.[279] Such interventions have implications for both individuals and societies and include addressing individual risk factors and measures to modify risk behaviours. Influencing personal relationships, working to create healthy family environments, and providing professional help and support for dysfunctional families is also part of this approach. At the societal level, this includes monitoring public places such as schools, workplaces and neighborhoods and taking steps to address problems that might lead to violence besides addressing gender inequality, and adverse cultural attitudes and practices. Addressing broader cultural, social and economic factors that contribute to violence and instituting measures to address these also necessitate that the gap between the rich and poor is bridged and that equitable access to goods, services and opportunities is ensured.

8.7 Burns

Various studies in Pakistan have identified burns as a common cause of injury, especially among women. Risk factors such as loose inflammable clothing, stoves at the ground level and bursting of kerosene stoves are some of the reasons. It is also believed that many of the burns are intentional. Tough legislative measures are necessary to ensure product safety in relation to stoves and to improve the design of newly-constructed kitchens. In addition, preventive strategies should feature as a part of health education interventions; this should also include public education in the immediate management of burns (such as rinsing with cold water).

8.8 Other injuries

Unavailability of data in Pakistan relating to other forms of injuries should not undermine their importance. Epidemiological studies done in other parts of the world show that injuries, such as those sustained in playgrounds and at leisure times, drowning, ingestion and poisoning, as well as injuries due to natural disasters are common. There is a need to study these injuries further

in Pakistan so that the potential for public health interventions can be determined and appropriate strategies instituted.

This section has reviewed current epidemiological data on injuries and the existing on ground programmes relating to their prevention, outlining their strengths and weaknesses. Based on this information, a strategy has been devised to guide future efforts aimed at injury prevention. The Action Agenda items as part of this strategy have been listed below. However, as part of the **Integrated Framework for Action**, injuries have been grouped alongside other NCDs in an integrated model which combines a range of interventions and actions across other NCD domains.

Injuries - Action Agenda

- Develop a sustainable and comprehensive system for injury data collection in Pakistan. Integrate injury surveillance with a comprehensive population-based NCD surveillance system. Supplement this by instituting a mechanism for utilizing multiple source data (e.g., facility-based data, police reports, reliable newspaper reports and data from other appropriate sources).✝
- Establish a National Safety Commission – an interdisciplinary group of stakeholders with the aim of improving safety at all levels.
- Establish a committee on road safety to foster a collaborative environment and facilitate inter-sectoral action for road safety.
- Integrate injury prevention as part of a comprehensive NCD behavioural change communication strategy.✝
- Improve road safety education through health communication systems with a particular focus on the high-risk group.
- Identify traffic black spots; develop and implement appropriate safety measures in such settings.
- Issue guidelines on safe installation of barriers.
- Enact and enforce legislation on locally manufactured vehicles.
- Regulate drivers' training and licensing.
- Develop and implement rules of the National Highway Safety Ordinance; upgrade provincial ordinances; upgrade Motor Vehicle Ordinance 1965.✝
- Develop a comprehensive policy, enact and enforce legislation for occupational health and safety.✝
- Develop product safety standards for household useables.
- Include preventive health in the mandate of organizations dealing with worksite safety.✝
- Enforce seatbelt and helmet laws.✝
- Enforce effective legislation on building safety.
- Evaluate NH&MP from a performance and fiscal perspective.
- Study patterns of occupational injuries and their determinants with a view to defining precise targets for preventive interventions.
- Formally evaluate interventions to reduce all forms of violence in Pakistan.
- Improve trauma care to the extent that a credible, cost-effective analysis suggests.✝
- Build capacity of health systems in support of injury prevention and control. Integrate public health programme monitoring and evaluation with NCD surveillance.
- Build a coalition or network of organizations at the national, provincial and local levels facilitated by federal and provincial health services to add momentum and legitimacy to injury prevention and control as part of a comprehensive effort for the prevention of NCDs.

✝ **Priority Action Areas**
Priorities within other Action Areas will be determined subsequently

9

Mental illnesses

Superstitious and supernatural convictions augment both stigma and discrimination

9.1 Context

Pakistan is a milieu where poverty, unemployment, illiteracy, malnutrition, gender biases and break-up of social support systems compound the stresses of urbanization and acculturation. In this setting, the country's health system is not ideally primed to take on the challenge that the escalating burden of mental illnesses presents. These austere conditions are a playing ground for superstitious and supernatural convictions – and often exorcism, which augment both stigma and discrimination and contribute to isolating the mentally ill. These considerations pose serious impediments to any comprehensive efforts aimed at promoting mental health and preventing mental illnesses in Pakistan. Public health efforts, therefore, need to be conceptualized in the context of these realities.

Global statistics on mental health are indeed alarming. Twenty-five percent of the world's population suffers from a mental disorder at some stage during the course of their lives whereas 450 million individuals are estimated to be currently suffering from a mental illness. The leading contributors, inclusive of depression, schizophrenia, drug and alcohol abuse represent four of the 10 leading causes of disability worldwide and account for 12% of the global burden of disease.[280]

These diseases exhort a considerable toll, both on the sufferer and the family. Individuals suffer from the distressing symptoms of the disorder in addition to being victims of unfair discrimination and stigmatization. This is compounded by inadequate and inaccurate information about mental illnesses and the traditional practice of treating the mentally ill in isolated asylums. On the other hand, the family has to bear the emotional, physical and economic stress of providing care and coping with behaviours;[281,282] this has implications for potential at work, social relationships and time.[283] Against this backdrop, it is important to recognize and develop the potential that exists to prevent a range of mental illnesses.

Health is traditionally regarded as being synonymous with physical health; mental health remains poorly understood and ill-deciphered in many parts of the world, particularly in the developing countries. However, it must be recognized that mental disorders are closely linked to physical illnesses,[284] and impose a range of consequences on the course and outcome of chronic co-morbid conditions.[285,286] Fundamental concepts in *caring for the mentally ill* have been revolutionized in the last decades – concepts of 'lunacy' and *care of the lunatic* have been replaced by the *comprehensive mental health model*. This is centred on safeguarding the rights of the mentally ill, reducing stigma and discrimination, integrating mental health with primary healthcare

Prevalence of common mental disorders in the rural areas is reported at 15% in men and 46% in women

and de-institutionalisation and rehabilitation of the mentally ill in the community. This approach has implications for support functions in a number of areas including policy building, manpower and material development and research. A systematic integrated approach to preventing mental illnesses and promoting mental health with active roles of the healthcare provider, the community, legislators and policy makers is key to this framework.

Being the first in WHO Eastern Mediterranean Region (EMRO) to have set up a National Programme for Mental Health (NPMH) in the year 1986, Pakistan has fared comparatively well in its response to this challenge compared with several other developing countries, 40% of whom do not have a mental healthy policy and 30% of whom do not have national mental health programmes. The Ministry of Health's commitment is reflected in the adoption of a policy framework in the shape of initiation of NPMH and the subsequent promulgation of the Mental Health Ordinance in the year 2001.[287] However, Pakistan can still be categorized amongst 90% of the developing countries that do not have a mental health policy for adolescents and children; furthermore, until now, it could also be grouped with 27% of the same that did not have a system for mental health surveillance.

9.2 Data on mental illnesses in Pakistan

9.2.1 Population-based data on major and minor mental illnesses

The 1987 approximations relating to the burden of mental illnesses in Pakistan underscored the need to take these up as a priority issue; estimates indicated then, that there were one million severely ill and 10 million mildly mentally ill within the country.[9] Subsequently, however, epidemiological surveys on sampled populations indicated that the situation was far graver.

A series of three community-based epidemiological surveys of rural and urban populations of Pakistan found high prevalence of common mental disorders, especially among women. These studies incorporated sound scientific methodologies for conducting community-based surveys utilizing validated screening tools that had been developed for the Pakistani population.[288] In the Pakistani culture, individuals with minor mental disorders frequently express their stress as somatic complaints; therefore, if a screening instrument is based primarily on psychological symptoms, many cases of neurotic disorders are likely to be missed. This understanding prompted the use of the Bradford Somatic Inventory (BSI), which was developed from symptom reports by psychiatric patients in Pakistan; these enquired about somatic symptoms in the local language, taking into account local cultural idioms of distress.

The prevalence of common mental disorders in the urban areas was reported at 10% among men and 25% among women.[289] Higher prevalence was reported in the rural areas; data from a survey conducted on a rural population in Chitral reported a prevalence of 15% among men and 46% among women.[290] This prompted the authors to resurvey another rural sample with a view to validating results from Chitral. Hence, employing the same methodology, data from the Susral village in Gujar Khan helped to validate earlier data by reporting prevalence rates of 25% among men and 66% among

Women experience increased levels of stress compared with men - both in the urban and rural areas

women.[291] The report has serious implications given that 66% of the population in Pakistan lives in the rural areas.[292] Classically, poor social conditions in the urban areas of developing countries are considered to be the underlying factor responsible for higher psychiatric morbidity observed in these settings.[293] However, there are few paired studies of rural-urban populations in the same geographical region to allow a direct comparison. Notwithstanding that the series of psychiatric surveys carried out in Pakistan were not designed to serve as a study of rural-urban migration, several explanations of the increased psychiatric burden in rural populations can be extrapolated from these studies. However, many of these remain speculative and generate several hypotheses. Detailed studies of rural to urban migration will help to shed light on factors responsible for the poor mental health status of people living in rural areas with important implications for preventive strategies.

In all the aforementioned surveys, women were found to experience increased levels of stress compared with men both in the urban and rural areas; this is in conformity with data from all over the world, where women are known to have increased psychiatric morbidity;[294] however, the gap appears wider in Pakistan. Factors relevant to women such as lack of control over their lives, low literacy rate, poverty, large family sizes, overcrowding and poor physical health have all been identified as risk factors.[295]

In view of the high prevalence of mental illnesses in the country, there is an urgent need to develop data sources to monitor their trends. Efforts have been ongoing as part of NPMH to include a uniform recording system for key mental illnesses into the Health Management and Information System (HMIS). As an initial step, appropriate indicators have been developed and integrated with the HMIS in five districts as part of a pilot intervention.[296] This arrangement will provide facility-based data and must be continued and supported as planned. However, it is also essential to monitor trends through a population-based surveillance mechanism. Within this context, studies done to date and referred to above are important with regard to any future attempts since they can serve as a baseline. Although they provide evidence for urgent public health action, they have their limitations in being generalizable to the entire population in Pakistan, which is heterogeneous and socio-culturally diverse. Integration of baseline information and methodology into the surveillance system should, therefore, be paralleled with efforts to expand its base.

Table 9.1 Prevalence of mental disorders in Pakistan†

	Males %*	Females %*	Children
Minor mental illnesses†			
Urban[289]	10%	25%	..
Rural[291]	15-25%	46-66%	..
Major mental illnesses[299]			..
Schizophrenia	8.1/10,000	6.1/10,000	..
Manic depression	13.5/10,000	14.5/10,000	..
Personality disorder	1.5/10,000	1.4/10,000	..
Mental retardation[297]			16-22/1000

† Regional data * Age 18 years and above

9.2.2 Facility-based data

Majority of those who access tertiary care facilities are males with predominance of those with major mental illnesses.[298] This finding highlights issues relating to women's access to care. The International Consortium for Mental Health Policy and Services has outlined mental health country profiles for Pakistan; this reported that the admission/discharge rate for major mental illnesses averages 10.8/10,000 population with an average length of stay estimated at 18.3 days. For depression, the corresponding figures are 38.7/10,000 in males and 43.3/10,000 in females.[299,300]

9.2.3 Data on substance abuse

With the promulgation of the Hudood Ordinance of 1979,[301] a total ban was imposed on the production, cultivation and sale of opium and the use of narcotics; however despite this, substance abuse continues to be on the rise. There have been several attempts at quantifying the magnitude of the issue in Pakistan. The first National Survey on Drug Abuse (NSDA) was conducted in 1982 and subsequently, surveys have been conducted every two to five years. A comparison of the results of the 1988 and 1993 surveys indicates that the reported number of drug abusers in Pakistan has risen from 2.24 million in 1988 to 3.01 million in 1993, with an estimated growth rate of 7%. According to these projections, the total number of chronic drug abusers should have been around 4.8 million in the year 2000. Results of NSDA conducted in 2000 are awaited to confirm this. Almost half of the total drug users in Pakistan (49.7%) are known to be addicted to heroin.[297] Surveys have also brought to light the fact that nearly 72% of the drug users are under 35 years of age, with the highest proportion being in the 26-30 age group.[302]

9.3 Framework for prevention of mental illnesses and mental health promotion

Healthcare providers in Pakistan are generally aware that those with major mental illnesses such as depression, psychosis, drug dependence and mental retardation need specialized psychiatric care. However, awareness relating to the needs of those with minor psychiatric ailments remains rudimentary, both among patients themselves and health professionals. The bulk of the 'chronically ill' with persistent and vague somatic symptoms continue to access general practitioners for care. In reality, a majority of these suffers from high prevalence mental disorders.

Contrary to popular belief, mental illnesses can be amenable to preventive interventions. The concept of primary prevention, however, has limited application in this context, as few causal associations have been established with direct implications for primary preventive interventions. These include causal associations of iodine deficiency with mental retardation,[303] birth trauma with epilepsy,[304] and pregnancy with depression.[305,306] Primary prevention strategies within this framework encompass the prevention and treatment of malnutrition, iodine deficiency, worm infestation, infections, drug abuse and preventing depression during pregnancies. These issues are already being targeted through appropriate public health strategies in the health sector. However, these diseases constitute a fraction of the burden of mental illnesses. The vast majority, inclusive of depression and

Treatment of mental illnesses is cost-effective and can be prescribed and dispensed in any setting

schizophrenia, occur as a result of the combined influence of genetic and environmental factors interacting at specific periods during an individual's lifetime. Lack of a specific causal association, coupled with difficulties in ascertaining the specific time of progression from the asymptomatic to symptomatic stage, makes it difficult to institute specific primary preventive measures. It is for this reason that the prevention-related emphasis in such diseases is on secondary prevention.

Secondary prevention strategies play important role in common psychiatric illnesses. Compelling scientific evidence indicates that 60% of the patients of substance abuse, 73% epilepsy patients and more than 50% patients with schizophrenia recover with treatment and do not relapse, if treatment is maintained.[307] Treatment of these illnesses is affordable, can be prescribed and dispensed in any setting and is cost-effective, compared with treatment for other NCDs.[308]

Over the last two decades, Pakistan's efforts in mental health promotion and disease prevention have been guided by WHO, which has played an important role in assisting countries by providing them with necessary guidance in the wake of the escalating burden of mental illnesses. This commitment was lately reflected in the dedication of the theme of the World Health Day and the World Health Report in the year 2001 to mental illnesses. This report outlined a set of scientifically valid and evidence-based solutions to addressing the current and future burden of mental illnesses.[xxiv] Following on these recommended solutions, and building on the World Health Day 2001 theme of 'Stop Exclusion: Dare to Care', the WHO Mental Health Global Action Programme adopted the slogan 'Close the Gap: Dare to Care'; this initiative provided a strategic framework to bridge the gap between what is needed and what is available. Within this Action Plan, several areas have been based on the WHO-recommended framework for action. These focus on awareness-creation, capacity-building within government institutions and professionals to develop and implement evidence-based policies and programmes; supporting adequate financing of mental health; reducing stigmatization and discrimination; promoting community mental healthcare; supporting mental health research; ensuring the availability of psychotropic drugs at the basic healthcare level and fostering multi-sectoral linkages.

9.4 Action areas within the framework

The action areas outlined as part of the relevant sections have implications for health promotion, as well as secondary and where applicable, primary prevention.

9.4.1 National policies, programmes and legislation

The National Programme for Mental Health, 1987was the outcome of broad-based professional deliberations. This programme was built on guidelines provided by the 1983 and 1985 EMRO introductory meetings guided by WHO's conceptual framework for setting up mental health policies in the

[xxiv] Provide treatment as part of primary care; make psychotropic drugs available; give care in the community; educate the public; involve communities, families and consumers; establish national policies, programmes and legislation; develop human resources; link with other sectors; promote community mental health; develop indicators; support more research.

developing countries. The conceptual framework of NPMH steered a sub-working group to develop the official document for the Government of Pakistan.[9] This was adopted in 1987 as the Seventh Five-Year Plan. This initiative was spearheaded by the Institute of Psychiatry, Rawalpindi: the WHO Collaborating Centre for Mental Health in Pakistan. The adoption of NPMH signified a policy decision made by the Government of Pakistan to integrate mental health with primary healthcare. Issues with its subsequent implementation notwithstanding, NPMH heralded a new era in mental health in Pakistan, outlining the need for universal provision of mental healthcare and substance abuse services by their incorporation in primary healthcare, a vision for a strategic integrated framework replacing an *ad hoc* approach to mental healthcare and a need for a greater focus on community mental health care. Specific strategies for achieving these objectives included capacity-building of healthcare providers, incorporation of mental health into training curricula, strengthening existing institutions, broadening the base of service delivery, streamlining referrals, ensuring the availability of drugs and inter-sectoral collaboration. Basing its decision on available epidemiological prevalence estimates, the potential for preventability and cost-effectiveness of preventive interventions, NPMH outlined priority areas for public health interventions in mental health for Pakistan. These areas include depression, psychosis, drug abuse and mental retardation.

Many of the objectives of NPMH have since been actively pursued and have resulted in the evolution of several demonstration pilot projects; these will be discussed in the subsequent sections under their respective heads. However, the most significant achievement of the programme related to its advocacy dimension, which culminated in the promulgation of the Mental Health Ordinance 2001, replacing the earlier Lunacy Act of 1912. This legislative framework has a firm grounding in scientific principles, integrating inputs from a range of local stakeholders. If implemented in true spirit, this instrument of law has the potential of significantly impacting on mental health and care of the mentally ill in Pakistan.

Mental Health Ordinance 2001 replaced the Lunacy Act of 1912

The salient features of this Ordinance are prevention and health promotion, protection of the rights of the mentally ill, development and establishment of new national standards of care and investment in support functions.[309] For the first time after the promulgation of this Ordinance, asylum-based isolation and segregation of the mentally ill has been replaced by the concept of community mental healthcare. In addition, a number of stakeholders relevant to the care of the mentally ill were identified and their roles and responsibilities were outlined. Moreover, clarifications were provided on the contentious and much-abused *period of detention*-related issues. The admission, leave and discharge criteria were defined and a section was added to highlight the human rights of the mentally ill.

The Ordinance mandated the establishment of a high-powered Federal Mental Health Authority (FeMHA) responsible for monitoring and evaluation of mental health in Pakistan. The terms of reference of the Authority have been clearly stipulated to oversee issues related to the implementation of the Ordinance. The Authority is responsible for developing a code of practice and guidelines for implementing the Ordinance. Due priority will be given to on-

For the first time, asylum-based isolation and segregation of the mentally ill was replaced by the concept of community care

job training relating to the implementation of the Ordinance to health professionals, police, and other stakeholders. There is also a need for strengthening and harmonizing working relationships with the police through intensified networking and exchange of information; this should focus on improving awareness of police relating to mental health issues and current mental health legislation. In addition, efforts should be made to improve police knowledge relating to prevention and management of violent incidents in people with mental illnesses.

9.4.2 Community care, information dissemination and reduction of stigma and discrimination

There is a global consensus on the need to foster community care for the treatment and rehabilitation of mentally ill patients with the use of all available resources; this replaces the earlier focus on institutional custodial care. Community care is known to be more advantageous with regard to the outcome and quality of life of individuals with chronic mental disorders; in addition, it is also in agreement with respect for human rights.

In Pakistan's context, achieving this objective necessitated a paradigm shift in mental healthcare; this was given legislative authorization with the promulgation of the Mental Health Ordinance 2001. Community care for the mentally ill is also socially acceptable, given that family structures are generally supportive in our cultures. However, a successful shift towards community care requires accessibility to health workers in the community and the existence of rehabilitation services, crisis support, protected housing, and sheltered employment at the community level. As part of NPMH, consensus has been achieved over a policy framework to guide a set of activities that will contribute to achieving these objectives. Progress in achieving these objectives will, in turn, determine the successful implementation of the Ordinance.

To lead the changes outlined in NPMH, several demonstration projects were set up by the Institute of Psychiatry, Rawalpindi, which is the WHO Collaborating Centre for mental health research and training in Pakistan. One of the earliest demonstration projects was set up in Gujar Khan in 1986.[xxv] This community mental health project was carried out in a planned series of phases with active inputs of local community leaders and healthcare providers. This involved training of around 800 primary care physicians and 3500 newly identified healthcare givers as defined in this framework; in addition, a community education project was set up with schools being the principal point of entry. This demonstration project and others that followed on a similar pattern developed a training module intended to be introduced into the work-plan of LHWs. However, this attempt did not generate the administrative and operational dialogue with the respective department, which could have facilitated the introduction of mental health into the work-plan of the LHWs on a sustainable basis. These experiences will, nonetheless, help to guide the introduction of mental health components into the work-plan of LHWs in future.

[xxv] A rural sub-district of the metropolis of Rawalpindi, with a population of just under one million.

Native faith healers remain an important source of care for the mentally ill in Pakistan

A mid-term impact evaluation of the Gujar Khan project with a control site comparison was conducted in the year 1991, five years after the initiation of this activity. Starting with similar baselines in both the intervention and the control sites, there appeared to be a significant and sustained rise in the detection and treatment rates of mental illnesses and the use of psychotropic drugs in the intervention districts compared with the control sites. This was evidenced by a review of ledgers that captured primary care data from both these sites. In addition, a positive trend was also observed in the general health indicators in the intervention site.[310]

School mental health interventions were also developed as a component of the community mental health project in Gujar Khan and other projects initiated later on a similar model. The objective of these interventions was to raise awareness about mental health issues among school children. Post-intervention evaluation with pre-intervention and control group comparisons of a school health intervention in the district of Rawlpindi demonstrated the success of the school health intervention.[311] The intervention resulted in improved levels of awareness relating to mental health issues; the effect of the programme permeated into the community beyond the sections that had direct access to school education; however, the message was diluted as it spread out from source.

These demonstration projects were a novel development and provided a reasonably sound base to plan further activities on. The experience prompted the Institute of Psychiatry, Rawalpindi: the WHO Collaborating Centre for mental health to develop a formal Government of Pakistan-Ministry of Health project proposal (PC-1) for replicating the demonstration experiences in five other districts in order to pilot this design in provincial settings – Jhelum (Punjab), Sukhur (Sindh), Pishin (Balochistan), Dera Ismail Khan (NWFP) and Mirpur (AJK) were chosen as pilot districts. This PC-1 packaged a budget projected over three years and included allocations for healthcare provider trainings, community interventions, media awareness campaigns and evaluations. Though this project has been officially approved, there are operational issues with tapping into the already committed PSDP resources. Lack of systems and procedures and operational difficulties are impediments to its successful implementation.

Awareness about mental illnesses will help to reduce both stigma and discrimination

The examples discussed illustrate important efforts that have been channelled towards developing community models of mental healthcare relevant to Pakistan's setting. Future efforts must be built on these foundations. Within this context, several aspects merit consideration. Firstly, the strengths and gaps of the model and the potential to further consolidate and integrate it within the framework of the comprehensive integrated programme for NCDs needs to be assessed with a view to up-scaling this at the national level. A broader-based consensus would be crucial to this approach. There is also a need to develop a larger population-based representative sample to enable improved understanding of the determinants of mental health and to guide the development, modification and evaluation of intervention studies on an ongoing basis. Secondly, there is a need to invest in developing public health infrastructure to enable the implementation of such projects on a sustainable

basis. Furthermore, any future efforts at the school level should be integrated with a comprehensive school health programme.

Public awareness is an important adjuvant to community mental healthcare; educating the general population, community activists, leaders and personnel involved in healthcare delivery at all levels creates awareness about the community care approach and other choices in care, enables the system to harness their support and primes the desired response to mental healthcare at all levels. In addition, it helps to reduce barriers to treatment and care by increasing awareness about mental disorders and the potential that exists to treat these illnesses with implications for the recovery process. Most importantly, awareness creation can help to reduce stigma and discrimination. However, such campaigns need to be guided by a thorough assessment of community concerns, existing beliefs, practices, attitudes and concepts and need to be refined on an ongoing basis through the assessment of their impact and evaluation of the process. The World Mental Health Day can be used as a platform for awareness creation. Public health measures including exercise, self-help and simple problem solving, sleep and hygiene are conducive for a mentally healthy society and need to be promoted as a priority.

Infrastructure for mental health remains rudimentary in Pakistan against the backdrop of the 10 million individuals that require services

Mental health education campaigns, integrated with awareness campaigns for other NCDs should be focused on the information-related needs of the community and should be aimed at modifying, wherever necessary, existing beliefs, practices, attitudes and concepts; in addition, they should also be focused on symptom recognition and access to healthcare. Furthermore, these efforts should be part of a much larger and sustainable effort.

It is also imperative to protect the interests of special groups including prisoners, refugees and displaced persons, women, children and those with disabilities. The prevalence of mental illnesses has been reported high in long term prison inmates in Pakistan.[312] Linkages need to be established or improved with prison departments and staff in accordance with the Mental Health Ordinance 2001.

Increased access to mental health services for refugees and displaced persons has to be ensured. Work of the NGO Horizon,[313,314] is a useful example in this regard. Moreover, there is a need to invest in improving mental health of women, children and people with disabilities. Within this framework, it is essential to support and strengthen NGOs that contribute to advocacy and support to special groups.

9.4.3 Provision of treatment as part of primary care

Integration of mental healthcare into the existing PHC system has been widely advocated; this approach is feasible in the developing countries since specialist psychiatric care has limited outreach. Capacity-building and integration of mental health at PHC level has been pilot tested as part of the Rawalpindi demonstration projects and subsequently incorporated into the expanded pilot strategy referred to in the previous section. These interventions have also been subject to cost-outcome evaluations in the native Pakistani setting, albeit with equivocal results.[315]

The Institute of Psychiatry, Rawalpindi: the WHO Collaborating Centre has undertaken initiatives to train PHC workers and health and field

administrators at the district level within the demonstration sites; training modules have been developed for this purpose. There are also informal reports of these modules being utilized for training in other parts of the country.[316] This effort has recently been evaluated – preliminary results are reported to be encouraging; however, there is a need to develop a system for ongoing evaluation of public health interventions in order to assess their impact. There is a clear need to build upon such efforts, and to draw voluntary efforts into the formal training loop. Simple, easy-to-understand mental health modules need to be introduced into a sustainable and scientifically valid CME programme model integrated across the range of NCDs.

Majority of the mentally ill tends to seek care at the local level, accessing traditional practitioners, local private providers and those within the primary healthcare system. Training that aims to impart a few basic skills to these healthcare providers has the potential of improving the detection, referral and management of common mental disorders. In the above-mentioned categories, training can logistically be best imparted to those within the public sector primary healthcare system as they have structured training systems. Training opportunities for other categories need to be defined.

9.4.4 Human resource and infrastructure development

From a meagre beginning of two mental hospitals at the time of its inception, Pakistan currently houses psychiatric units in most state-run and private teaching medical institutions and allied hospitals, with services available at both the District and Tehsil levels. There are currently an estimated 2154 hospital beds dedicated to psychiatry, centred predominantly on large urban metropolitan areas. Despite this apparent expansion, the infrastructure for mental health remains rudimentary in Pakistan against the backdrop of the 10 million individuals that require services. Existing units remain understaffed and lack basic facilities essential for secondary prevention of major mental disorders. Studies show that there is great variation across the country with regard to the opportunities that exist to access specialized psychiatric care; overall specialized care is accessible to those residing in the large metropolitan areas. There is, therefore, a need to strengthen existing specialist psychiatric facilities and expand their base; more importantly, however, the need to build capacity at the secondary and basic levels is necessitated. In addition, mental heath does not feature at the Basic Health Care level,[xxvi] though plans exist on paper to ensure its integration with the basic level of care. Such efforts must be pursued in the framework of the integrated approach to NCDs as part of this Action Plan and must evolve in harmony with capacity-building efforts at the community level. Protocols and guidelines developed by FeMHA will be useful in this regard.

In view of the high prevalence of substance abuse in the country, institutional facilities for substance abuse have increased from 32 in 1986 to 232 in 2002.[299] However, most of these focus on treatment rather than rehabilitation. It is essential to invest in the further development of such facilities and to

[xxvi] Basic Health Unit is the most peripheral facility of the healthcare system; planned to serve 5-10,000 people over a catchment area of 15-25 square miles. Each BHU is staffed by one medical officer and support staff.

build their capacity so that they serve as both treatment and rehabilitation sites.

The National Programme for Mental Health spelt out an urgent need to scale up professional capacity in the area of mental health, making the case for this approach in view of the then existing situation as it related to professional capacity. Today, there are an estimated 2.3 psychiatrists for a population of one million. The College of Physicians and Surgeons of Pakistan is presently producing an average of 10 psychiatrists per year. This falls far short of what needs demand. There is, therefore, a need to support and provide training opportunities to young doctors likely to take up psychiatry as a long-term career option. An increase in numbers will enable trained psychiatrists to seek employment opportunities at the district and tehsil levels and will help in bridging the gap in professional capacity at the grassroots level.

The framework of NPMH provided a mandate to establish and strengthen professional capacity in mental health. This mandate enabled the initiation of undergraduate and postgraduate training for doctors, psychologists, nurses, community mental health nurses and community workers. More than 65 psychiatrists have been trained to-date; many psychiatrists are now cascading out this training in Karachi, Hyderabad, Quetta, Peshawar, Lahore and Multan. Despite the lack of financial support through formal sources, such efforts have played an important part in capacity-building and training. This is evidenced by a significant increase in number of psychiatrists from 120 in 1987 to 342 in 2002.[9] A majority of these, however, remain centred on large urban areas. In addition, nurses, psychologists and community mental health workers have also been trained as part of this initiative. The methodology employed as part of trainings and the training materials will be valuable to the health professional capacity-building initiative for NCDs as part of the Action Plan.

Psychologists play an important role in providing comprehensive mental healthcare within any setting. With the presently qualified 52 psychologists in the country, this role is being missed out on. In addition, the present capacity to produce around 40 psychologists per year by training institutions in Rawalpindi, Lahore and Karachi also falls short. There is, therefore, a need to scale up capacity to train more psychologists within the country and to involve them in community initiatives.

Social workers can play an important part in community psychiatry

The National Programme for Mental Health has also developed practical training modules for nurses and community psychiatric nurses; curricula have been developed and adapted for the undergraduate and postgraduate levels. A two-year postgraduate diploma for psychiatric nursing has been initiated in nurses' training colleges in the country and so far 92 psychiatric nurses have qualified.

Social workers can also play an important part in community psychiatry; however, there are no formal public sector programmes modelled to harness their potential in order to provide care for the mentally ill in communities; they are also not regarded as a formal cadre of professionals. As part of NPMH, linkages were developed with the National Rural Support Programme (NRSP), which has a nationwide network of community organizations to assist with development activities. This linkage will enable

community mental health to be plugged into the work-plans of village activists in remote rural areas. The potential that exists within this linkage needs to be maximized.

A discussion on human resource development for comprehensive mental healthcare in Pakistan's context will not be complete without discussing the role of native faith healers and referring to 'pathways to care'. Faith healers are widely recognized as moral and spiritual guides in our country and are consulted by community members both in the rural and urban areas for a variety of ailments. Studies reveal that they are an important source of care for the mentally ill in the subcontinent.[317] In addition, studies carried out in the native Pakistani setting have provided useful insights into their practices and have outlined gaps in their knowledge, which can be potential targets of intervention; these studies have established that it is possible and feasible to collaborate with them.[318] Their endorsement and referral for psychiatric care is envisaged as being valuable to concepts being promoted as part of this Action Plan. Such a course of action is in line with evidence-based approaches that spell out the need for developing indigenous approaches based on religious, cultural and psychosocial values. However, this must be preceded by a validation of methodologies employed for this purpose.

9.4.5 Availability of psychotropic drugs

The National Programme for Mental Health drew up a list of essential drugs, which should be made available at every healthcare facility; this drug list includes: phenobarbitone, chlorpromazine, imipramine, procyclidine and diazepam. These drugs are cost-effective and affordable and can easily be made available at the primary care level. However, this list needs to be updated. Ensuring their availability has implications for training health professionals at all healthcare levels in the safe use of these drugs. However this drug list in the process of being revised according to recent evidence.

9.4.6 Linking with other sectors

As with other NCDs, mental health promotion and prevention of illnesses is a multidisciplinary challenge; the multi-sectoral response to this issue has been discussed under respective heads in the previous sections. This section deals with intra-sectoral collaborations with a view to identifying some of the key stakeholders.

Several organizations are working in Pakistan with mandates and objectives that fall within the framework of what this Action Plan outlines. Their potential must be harnessed. This is in line with the recommended strategy as part of this Action Plan which aims to draw all stakeholders into the loop within a larger comprehensive framework and guide their activities to contribute to impacting collective indicators with a mechanism for monitoring and evaluation of individual contributions.

Named after the sponsoring body, the Fountain House in Lahore has evolved from the Pakistan Association of Mental Health (PAMH); the institution is the centre of a range of rehabilitation activities and has a volunteer component which can be useful to supporting community care. The Edhi Foundation has several protective housing facilities for the mentally ill.[319] Such institutions should be target sites for improving care of the mentally ill.

The role of professional societies and NGOs in advancing the cause of mental health is critical

This has implications for capacity-building of care givers, counselling and providing support and rehabilitation and vocational services within the institutional structure. It also needs to be recognized that such institutions have the capacity and the mandate of generating and allocating resources for the care of the mentally ill, given appropriate orientation, training and guidance.

It is also essential to take into account, the activities and scope of other NGOs such as Karawan-e-Hayat, War Against Rape, Dast-e-Shafqat, Bedari, Rozan, Sahil, Human Rights Commissions and others with a similar mandate. An assessment of their capacity and the current outreach with regard to their relevance to being contributory to larger objectives set within this Action Plan, need to be determined. Such NGOs must be drawn into the implementation loop and their potential harnessed.

The role of professional societies such as the Pakistan Psychiatric Society in advancing the cause of mental health is pivotal. A greater focus on the public health approach and endorsement of efforts outlined in this Action Plan are critical in this regard.

This section has reviewed current epidemiological data on mental illnesses in Pakistan and the existing on ground programmes relating to their prevention, control and health promotion outlining their strengths and weaknesses. Based on this information, a strategy has been devised to guide future efforts aimed at prevention of mental illnesses and promotion of mental health. The Action Agenda items as part of this strategy have been listed below. However, as part of the **Integrated Framework for Action**, mental illnesses have been grouped alongside other NCDs in an integrated model which combines a range of interventions and actions across other NCD domains.

9.5 Mental Health - Action Agenda

- ✍ Integrate prevention and control of mental illnesses with a comprehensive strategic NCD prevention, control and health promotion framework. Derive guiding principles from the National Programme for Mental Health.✝
- ✍ Prioritize integrated community mental healthcare, integration of mental health with primary healthcare and elimination of the stigma and discrimination associated with mental illnesses and substance abuse.✝
- ✍ Integrate surveillance of mental illnesses in the comprehensive population-based NCD surveillance system. Build on and seek guidance from previously conducted similar efforts.✝
- ✍ Develop sustainable public health infrastructure to support community mental health initiatives.
- ✍ Create awareness about mental health as part of an integral component of NCD behavioural change communication strategy. ✝
- ✍ Draw all categories of healthcare providers and community activists into the loop to develop a comprehensive community care model for the mentally ill. Derive guidance from relevant demonstration projects in the Pakistani settings.
- ✍ Integrate school health efforts aimed at mental health promotion within the framework of a comprehensive NCD prevention school health programme.
- ✍ Invest in building the requisite human resource necessary for implementing the Mental Health Ordinance 2001.✝
- ✍ Strengthen and harmonize working relationships with law enforcing agencies through intensified networking and exchange of information.✝
- ✍ Integrate mental health into health services as part of a comprehensive and sustainable, scientifically valid, culturally appropriate and resource-sensitive CME programme for all categories of healthcare providers.
- ✍ Create appropriate training opportunities for all categories of healthcare providers.
- ✍ Develop capacity at the secondary and basic healthcare levels in harmony with capacity-building efforts in the community.
- ✍ Broaden the base of existing facilities and develop new facilities for treatment and rehabilitation of substance abuse.
- ✍ Ensure availability of essential psychotropic drugs at all healthcare levels.
- ✍ Build capacity of health systems in support of prevention and control of mental illnesses. Integrate public health programme monitoring and evaluation with NCD surveillance.✝
- ✍ Build a coalition or network of organizations at the national, provincial and local levels facilitated by federal and provincial health services to add momentum and legitimacy to prevention and control of mental illnesses as part of a comprehensive effort for the prevention of NCDs.
- ✍ Support FeMHA to develop a code of practice and guidelines for implementing the Mental Health Ordinance. Support on-job training regarding Ordinance implementation for health professionals, police, and other stakeholders.✝
- ✍ Improve availability of special facilities for people with substance abuse who cannot be managed in general facilities.
- ✍ Protect the interests of special groups (prisoners, refugees and displaced persons, women, children and individuals with disabilities). Support and strengthen NGOs that contribute to advocacy and extend support to special groups.
- ✍ Promote need-based research for contemporary mental health issues. ✝

✝ **Priority Action Areas**
Priorities within other Action Areas will be determined subsequently

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Integrated Framework for Action

National Action Plan for Prevention and Control of Non-Communicable Diseases and Health Promotion in Pakistan

The **Integrated Framework for Action** is a concerted and integrated approach to addressing the multidisciplinary range of issues within a prevention, control and health promotion framework across the range of NCDs. It is modelled to impact a set of indicators though the combination of a range of actions in tandem with rigorous formative research.

	Action Agenda Items	Process Indicators	Output Indicators	Outcome Indicators
C	**Integrated Action Items** (Common to Cardiovascular Diseases, Diabetes, Tobacco Use, Chronic Respiratory Diseases, Cancer, Injuries and Mental Illnesses)			
C 1	**Surveillance**[1]			
	Process Development and maintenance of an integrated population-based NCD surveillance system incorporating programmme monitoring and evaluation components **Outputs** Technical and scientific publications **Intermediate Outcomes** Surveillance and process evaluation data used for decision making	Consultations and workshops for the development of an integrated methodology and tools for a common population-based NCD surveillance system/programme evaluation system Definition of most relevant indicators for monitoring and evaluation in all NCD domains Building technical capacity and training assessment at various levels Development of methodologies for qualitative research (policy and evaluation) Description of data sources	Reports and publications produced through acquisition of data Feedback of information to health authorities Information provided to media Presentations and seminars for public, health professionals and policy makers Number of individuals and professionals reached with results Results/material disseminated to policy makers, public, media and professional groups Demands received to obtain programme information Creation and utilization of database sources	Decisions made using process evaluation indicators** Policy, programme or scientific insights obtained through indicators**
C 2	**Integrated Behavioural Change Communication Strategy**			
	Process Development of a research-guided, behavioural change communication strategy for NCDs. Implementation at the national level through media and community interventions. **Output** Media and community interventions	**Common to Media and Community Interventions** Definition of issues associated with the target group; baseline assessments of knowledge level, practices and perceptions Definition of clear measurable objectives Constitution of multidisciplinary teams consisting of	**Common to Media and Community Interventions** Implementation of a high visibility behavioural change communication plan incorporating strong social marketing approaches Integration of all NCD domains in the mutually reinforcing plan	Proportion of individuals currently smoking cigarettes** Proportion of individuals with knowledge relating to the ill effects of tobacco* Proportion of individuals with knowledge relating to the ill effects of passive smoking*

[1] A common population surveillance mechanism for all NCDs (with the exception of cancer). The model includes population surveillance of main risk factors that predict many NCDs and combines modules on population surveillance of injuries, mental health and stroke.

Integrated Behavioural Change Communication Strategy……..Contd.

Action Agenda Items	Process Indicators	Output Indicators	Outcome Indicators
Outcome Change in awareness (intermediate outcomes) and risk factor levels (outcomes)	members from the media, public health specialists, national programme managers, NGOs, community activists, local opinion leaders, etc. Workshops and consultations to define measurable objectives Consultations to link programme assessment and process evaluation with risk factor surveillance Development of a high visibility behavioural change communication plan incorporating strong social marketing approaches **Media Interventions** Development of linkages with media Integration of social marketing concepts with media interventions Definition of target messages Development of strategies for communicating messages and selection of mediums Development of messages and vignettes **Community Interventions** Assessment of community needs Profiling of community resources Definition of community activists and leaders Development of linkages with social development organizations Development of linkages with primary healthcare systems, National Programme for Family Planning and Primary Health Care and local NGOs Workshops/consultations to develop the methodology for community interventions	Linkage of programme assessment and process evaluation with risk factors surveillance **Media Interventions** Hours of average exposure per year to various educational messages Percentage of target population reached by various activities Number of electronic media interventions per year Number of print media interventions per year Number of news releases Increase technical capacity to set up/ organize/implement social marketing campaigns **Community Interventions** Number of coalitions built Number of community meetings held Number of members present in meetings Relevant community stakeholders absent from meetings Number of partners supporting and not supporting decisions Number of advocacy actions taken Tools of intervention developed	Proportion of adults with knowledge relating to the risks of cancer* Proportion of adults with knowledge relating to the warning sign of cancer* Proportion of individuals with knowledge relating to the risks of diabetes* Proportion of *at-risk* individuals screened for diabetes** Proportion of individuals using seatbelts in cars** Proportion of individuals using helmets while on motorbikes** Proportion of individuals having suffered a Road Traffic Crash** Proportion of individuals requiring medical treatment for injuries** Proportion of individuals aware of the cardiovascular disease risks * Proportion of inactive persons** Median level of physical activity** Proportion of individuals eating less than 5-7 servings a day of fruits and vegetables** Mean BMI** Mean waist circumference** Mean blood pressure levels** Proportion of overweight and obese individuals** Proportion of individuals screened for high blood pressure** Proportion of individuals with high blood pressure** Proportion of individuals on treatment for high blood pressure**

Action Agenda Items	Process Indicators	Output Indicators	Outcome Indicators
	Workshops/consultations to develop the tools of intervention	Number of preventive activities initiated, groups targeted; number of individuals participating Development of a locally applicable and relevant intervention strategy Type and extent of resources committed by various partners New trained persons with technical skills New information systems to assess community skills	Proportion of individuals with knowledge relating to mental illnesses and their prevention*
C 3 Integrated Reorientation of Health Services			
Process Development and implementation of a sustainable, scientifically valid, culturally appropriate and resource-sensitive CME programme for professional education and involvement of all categories of healthcare providers in the prevention of NCDs and its integration in health services Upgrading infrastructure in healthcare facilities and ensuring availability of essential drugs at the basic healthcare level **Outputs** Sustainable educational opportunities for medical students and all categories of healthcare providers. Upgrading of infrastructure and availability of drugs **Intermediate Outcomes** Change in awareness and practices of healthcare providers and change in awareness and risk factor levels of patients	Workshops and consultative deliberations to include the prevention of NCDs in a comprehensive CME programme for all categories of healthcare providers and in the school health curriculum Development of sustainable, scientifically valid, culturally appropriate and resource-sensitive CME programmes for training all categories of healthcare providers Development of educational tools which incorporate resource-sensitive risk management and assessment algorithms Development of strategies to package positive incentives to practice prevention Inclusion of health promotion and disease prevention theory and practice in medical and paramedical curricula Establishment of internships on health promotion and disease prevention at the undergraduate and postgraduate levels Endorsement of efforts by scientific societies Ensuring availability of and access to educational opportunities for physician, non-physician healthcare providers, nurses and undergraduate students	Number of health professionals with access to course/curricula with modules for health promotion and disease prevention Existence of scientifically valid, culturally appropriate and resource-sensitive training tools Number of trained professionals Number of health professionals certified Number of health professionals who acquire preventive knowledge and skills Participation in community, regional and national health promotion activities Adoption of preventive practices by healthcare providers Availability of drugs essential for the prevention of NCDs at all levels of healthcare Number of calibrated blood pressure devices available at all levels of healthcare	Proportion of healthcare providers practicing opportunistic screening for high blood pressure* Proportion of healthcare providers screening at-risk individuals for diabetes* Proportion of healthcare providers screening at-risk individuals for dyslipidaemia* Proportion of healthcare providers screening for breast cancer* Proportion of healthcare providers giving lifestyle advice* Proportion of healthcare providers prescribing drugs which are critical in primary and secondary prevention of NCDs* Number of patients with substance abuse presenting to detoxification centres* Number of patients with mood disorders presenting to psychiatric facilities* Number of referrals to psychiatric facilities* Number of patients with affective disorders presenting to psychiatric facilities*

	Action Agenda Items	Process Indicators	Output Indicators	Outcome Indicators
S	**Action Items Specific to Individual NCD Domains**			
S 1	**Legislative and/or Regulatory Measures**			
	Process, Outputs and Intermediate Outcomes	**Common Process Indicators**	**Common Output Indicators**	**Common Outcome Indicators**
	Enactment and enforcement of effective legislation	Activities to garner public support for legislation/regulation essential to the prevention and control of NCDs Media accounts highlighting the need for legislative and regulatory measures Multi-stakeholder dialogue between the Ministry of Finance, Customs, economists, multilateral donors and bilateral lending agencies Fiscal and policy research Meetings with public and members of the Parliament Policy and technical submissions in support of legislative and regulatory changes Proposals to legislators Establishment of task forces and working groups to support parliamentary committees	Existence of plans of actions for advocacy groups Review reports and minutes from parliamentary committees Mechanism and resources for enforcement of legislation Participation in hearings Existence of new legislation/regulations Legislation/regulations enforced Public consumer support for legislation/regulations	Existence of new legislation/regulations* Legislation/regulations enforced* Public consumer support for legislation/regulations*
			Specific Indicators	
	Mental Health Ordinance 2001		Development of national standards and guidelines for care and treatment of mentally ill patients Number of psychiatric facilities established for assessment, treatment, rehabilitation and after-care of mentally disturbed patients Number of community-based mental health services established Number of mentally disturbed patients admitted for assessment and treatment Number of court cases relating to mentally disturbed patients being processed by a court of protection	

Legislative and/or Regulatory Measures……..Contd.

Action Agenda Items	Process Indicators	Output Indicators	Outcome Indicators
		Number of visits by board of visitors to jail inmates Number of forensic psychiatric services established Number of cases admitted and retained in facilities according to various sections of the Ordinance Number of managers appointed to handle assets of mentally ill patients	
Food standards legislation		Establishment of country standards Enactment and enforcement of food standards legislation	
Legislative and/or regulatory measures to reduce dependence on revenues generated from tobacco		Decreased dependence on revenues generated from tobacco Reduced production of tobacco in the market	
Legislative and/or regulatory measures to discourage tobacco cultivation and assist with crop diversification		Withdrawal of direct and indirect subsidies Provision of technical assistance for the cultivation of equally remunerative crops Ensuring insurance protection Tobacco crop diversification Assisting with income support for tobacco farmers until the process of diversification is complete and sustainable	Reduced production of tobacco*
Legislative and/or regulatory measures for gradual phasing out of all types of advertising		Measures introduced in the Parliament are passed	Complete ban on tobacco advertising*
Legislative and/or regulatory measures to develop a price policy for tobacco products		Price policy developed and implemented	Decline in per capita consumption of tobacco*
Legislative and/or regulatory measures to subject tobacco to stringent regulations such as those governing pharmaceutical products		Measure passed by the Parliament	Relevant laws applied to tobacco*

Legislative and/or Regulatory Measures……..Contd.

Action Agenda Items	Process Indicators	Output Indicators	Outcome Indicators
Legislative and/or regulatory measures to deter tobacco counterfeiting		Enhanced market intelligence Supporting the effective implementation of laws that exist on smuggled contrabands	
Legislative and/or regulatory measures to regulate the import of areca nut		Ban on areca nut import	
Legislative and/or regulatory measures to ensure occupational health and safety		Revision of NEQS Redefinition of the role of independent and transparent third party monitoring of effluent discharge Development of infrastructure capable of specialized analysis necessary for such monitoring efforts Improved understanding of safety in industrial settings Mandatory use of Material Data Safety Sheets	
Upgrade legislation on building regulations and its implementation		Existence of regulations and their enforcement	
Legislative and/or regulatory measures to ensure safety in the design of locally manufactured vehicles		Existence of regulations and their enforcement	
Development of rules of the National Highway Safety Ordinance; upgrading of the Motor Vehicle Ordinance of 1965 and relevant provincial ordinances		Development and implementation of rules of the NHSO 2000 Upgrading of provincial ordinances Upgrading of the MVO 1965	
Legislative and/or regulatory measures relating to training of drivers/licensing		Existence of regulations relating to training of drivers and their enforcement	
Development of product safety standards		Product safety standards developed and implemented	

	Action Agenda Items	Process Indicators (common to research)	Output Indicators (common to research)	Outcome Indicators (common to research)
S 2	**Research (specific areas)**			
	Identification of causal associations specific to the population in NCDs in order to define precise targets for preventive interventions Clinical end point trails to define the best therapeutic strategies for prevention of NCDs weighing cost against economic feasibility Policy and operational research of local relevance in order to examine tobacco tax policies, marketing and advertising strategies Assessment of cancer trends within various industrial settings with potential exposure to carcinogenic agents utilizing existing data sources Identification of black spots on highways and within city roads; assessments should guide interventions appropriate to reduce the risk of highway crashes in these settings	Capacity assessment at various levels Building technical capacity and training assessment at various levels Description of data sources Development of proposals Development of tools to collect information/data Training courses given or taken to enhance skills Definition of most relevant indictors for monitoring and evaluation	Existence of qualified personnel, resources and equipment Reallocations to research Areas where research has been conducted Technologies transferred or given Feedback of information to health authorities Publications prepared through acquisition of data Information provided to media Presentations and seminars for public, health professionals and policy makers Number of individuals and professionals reached with results	Scientific contribution to the science of the prevention of NCD**

* Intermediate outcomes
** Definitive outcomes

Acronyms

ACE (Inhibitor)	Angiotensin Converting Enzyme
AJK	Azad Jammu and Kashmir
AKUH	Aga Khan University Hospital
ARUP	Association of Road Users of Pakistan
ASIR	Age-specific incidence rate
ASR	Age-standardized rates
ATS	American Thoracic Society
BDN	Basic Development Needs
BHU	Basic Health Unit
BMI	Body mass index
BPH	Benign Prostatic Hyperplasia
CAD	Coronary artery disease
CARMEN	Conjunto de Acciones para Reduccion Multifactorial de Enfermedades Non Transmissible (Set of actions for multifactorial reduction of Non-Communicable Diseases)
CDC	Centers for Disease Control and Prevention
CI5	Cancer incidence in five continents
CINDI	Countrywide Integrated Non-Communicable Disease Intervention
CME	Continuing medical education
CNG	Compressed Natural Gas
CNS	Central nervous system
CO	Carbon monoxide
COPD	Chronic obstructive pulmonary disease
CRD	Chronic respiratory disease
CVD	Cardiovascular disease
DALYs	Disability adjusted life years
DCO	District Coordinating Officer
ECG	Electrocardiogram
EOBI	Employees' Old Age Benefit Institution
EPI	Expanded Programme for Immunization
FCTC	Framework Convention on Tobacco Control
FIFA	Federation of International Football Association
GDP	Gross Domestic Product
GNP	Gross National Product
GYTS	Global Youth Tobacco Survey
HDL	High-density lipoprotein
IARC	International Agency for Research on Cancer
IFA	Integrated Framework for Action
IGT	Impaired glucose tolerance
IRNUM	Institute of Radiotherapy and Nuclear Medicine
JPMC	Jinnah Postgraduate Medical Centre
LHV	Lady Health Visitor
LHW	Lady Health Worker
MDGs	Millennium Development Goals
MoU	Memorandum of Understanding
MSDS	Material Safety Data Sheet
MVR	Motor Vehicle Ordinance Rule
NCD	Non-Communicable Disease
NEAP	National Environment Action Plan
NEAP-SP	National Environment Action Plan - Support Programme
NEQS	National Environmental Quality Standards
NGO	Non-governmental organization
NH&MP	National Highway and Motorway Police
NHA	National Highway Authority
NHLBI	National Heart, Lung and Blood Institute
NHSO	National Highway Safety Ordinance
NICVD	National Institute of Cardiovascular Diseases
NLC	National Logistic Cell
NPMH	National Programme for Mental Health
NTRC	National Transport Research Centre
NWFP	North-West Frontier Province
PAMH	Pakistan Association of Mental Health
PC-1	Pakistan Planning Commission Project Proposal-1
PCB	Pakistan Cricket Board
PEPA	Pakistan Environmental Protection Act
PEPO	Pakistan Environmental Protection Ordinance
PHC	Primary healthcare
PIA	Pakistan International Airlines
PIMS	Pakistan Institute of Medical Sciences
PMA	Pakistan Medical Association
PPE	Personal protective equipment
PREMISE	Prevention of REcurrences of Myocardial Infarction and StrokE
PRSP	Poverty Reduction Strategy Paper
PSA	Prostate-specific antigen
PSO	Pakistan State Oil
PTC	Pakistan Tobacco Company
RHD	Rheumatic heart disease
RTC	Road traffic crashes
SMARP	Self-monitoring and reporting
SMS	Swift Mail Service
TFI	Tobacco-Free Initiative
THQ	Tehsil headquarters
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
WHO	World Health Organization
WHO EMRO	World Health Organization Eastern Mediterranean Regional Office
WHO JPRM	World Health Organization Joint Programme Review Mission
WHO WPRO	World Health Organization Western Pacific Regional Office
WTO	World Trade Organization

Glossary

Accountability: accountability results when decision makers at all levels fulfill their obligations and are made answerable for their actions. Setting explicit objectives and defining how progress towards them will be monitored makes it easier to achieve accountability.

Advocacy: in the present context, the action taken by health professionals and others with perceived authority to influence the decisions of communities and governments.

Age-standardized prevalence: age-standardized prevalence presents one summary figure for a total population of different age groups. Age is a variable for which adjustment is required because of its marked effect on morbidity and mortality.

Age-adjusted death rate: the number of deaths occurring per 100,000 populations per year; calculated in accordance with a standard age structure to minimize the effect of age differences when rates are compared between populations or over time.

Aspergillus: a type of fungus.

Assessment: in the present context, the obligation of a public health agency to monitor the health status and needs of its community regularly and systematically; one of the three core functions of public health.

Astrocytoma: most common type of primary brain tumour; also found throughout the central nervous system.

Asymptomatic: not having any complaints or discomfort of a disease at present.

Atherosclerosis: a pathological condition affecting the medium-sized and larger arteries, especially those that supply the heart (the coronary arteries), the brain (the carotid and cerebral arteries), and the lower extremities (the peripheral arteries), as well as the aorta; underlies the occurrence of heart attacks, many strokes, peripheral arterial disease, and dissection or rupture of the aorta.

Attributable: the quality or characteristic that can be assigned to the element of interest.

Average cost: total cost divided by total quantity. It provides the cost per unit.

Beeri: a handmade form of cigarette made by the consumer by wrapping tobacco in Temburni leaves; although the quality of tobacco used is smaller than in the cigarette, the tar yield, nicotine and concentration of carcinogens released exceed that of an average cigarette.

Behavioural change: an intervention approach that uses public information and education to promote behavioural patterns favourable to the population as a whole; also includes interventions (e.g., counseling) at the group or individual level for the same purpose.

Behavioural patterns: in the present context, habits of living that influence health. (e.g., diet, physical activity, smoking).

Blood cholesterol: the blood concentration of a family of lipid or fatty molecular compounds obtained directly from the diet or produced in the body from fatty dietary components; a necessary factor in development of atherosclerosis (see *atherosclerosis*); subtypes of cholesterol differ in their relation to CVD risk, with high-density lipoprotein (HDL) cholesterol considered *good* and low-density (LDL) cholesterol considered *bad*.

Brand switching: consumer changing the item that he/she is using with another similar product of a different company.

Burden of disease: the total significance of disease for society beyond the immediate cost of treatment. It is measured in years of life lost to ill health as the difference between total life expectancy and disability-adjusted life years.

Capacity-building: in the present context, capacity-building is the development of the technical expertise to plan, implement and evaluate interventions aimed at preventing or controlling non-communicable diseases in a variety of settings. Areas of expertise in capacity-building include problem identification, epidemiological and behavioural risk factor analysis, coalition-building, programme implementation, knowledge of intervention methodologies, process, impact and outcome evaluation, and the ability to obtain ongoing support and funding through administrative and legislative means, beyond the life of any particular source of funding.

Carcinogens: items related to the cause of cancer.

Cardiovascular disease(s): may refer to any of the disorders that can affect the circulatory system, but often means coronary heart disease (CHD), heart failure and stroke, taken together.

Cardiovascular disease prevention: a set of interventions designed to prevent first and recurrent cardiovascular disease events (e.g., heart attack, heart failure and stroke). For cardiovascular diseases, *primary prevention* refers to detection and control of risk factors, whereas *secondary prevention* includes long-term case management for survivors of CVD events.

Cardiovascular health promotion: a set of interventions designed to reduce a population's risk for CVD through policy, environmental, and behavioural changes; also supports other approaches that apply to people who have suffered recognized CVD events (e.g., by facilitating public access to emergency care or by fostering social/environmental and behavioural changes that reinforce *secondary CVD prevention*); sometimes identified with *primordial CVD prevention*; complements CVD prevention.

Cardiovascular health: a combination of favourable health habits and conditions that protect against development of cardiovascular diseases.

Case fatality rate: the proportion of cases of a disease event ending in death within a defined interval.

Case-control study: in this study, people diagnosed as having a disease (cases) are compared with persons who do not have the disease (controls). The purpose is to determine if the two groups differ in the proportion of persons who had been exposed to a specific factor or factors.

Causal association: we can define causal association by saying that A causes B. Certain theories describe an association to be *causal* if, (i) A is prior to B (ii) a change in A correlates with a change in B, (iii) this correlation is not because of another element e.g., C, D etc.

Cerebral: related to the brain.

Cluster randomization: in cluster randomization the population is divided into groups (clusters) and then a random (unsystematic, indiscriminate) sample of these groups or clusters is selected.

Coalition-building: the establishment of a temporary alliance of fractions, parties, individuals or groups for a specific purpose.

Community: a specific group of people, often living in a defined geographical area, who share a common culture, values and norms and are arranged in a social structure according to relationships which the community has developed over a period of time. Members of a community gain their personal and social identity by sharing common beliefs, values and norms, which have been developed by the community in the past and may be modified in the future. They exhibit some awareness of their identity as a group and share common needs and a commitment to meeting them.

Community mobilization: a process aimed at enabling communities to understand and control the circumstances affecting their lives. It acknowledges that agents of change can be found wherever the decisions that affect people's ability to influence their lives are made and implemented.

Comprehensive public health strategy: an approach to a major health problem in the population that identifies and employs the full array of potential public health interventions, including health promotion and disease prevention.

Coronary heart disease: heart disease caused by impaired circulation in one or more coronary arteries; often manifests as chest pain (angina) or heart attack.

Cost-intensive: measures needing high costs.

Cross-sectional study: in the present context, a type of research study in which both risk factors and diseases are ascertained at the same time usually employing clinical tests, interviews and measures of exposures.

Depression: mental state of depressed mood characterized by feelings of sadness, despair and discouragement.

Diabetes (or diabetes mellitus): a metabolic disorder resulting from insufficient production or utilization of insulin, commonly leading to cardiovascular complications.

Dietary imbalance: a pattern of dietary intake that lacks a desirable combination and overall intake to foods and nutrients to promote good health (e.g., excessive intake of saturated fat, salt, total calories).

Disability-adjusted life expectancy: the number of healthy years of life that can be expected on average in a given population. It is generally calculated at birth, but estimates can also be prepared at other ages. Healthy life expectancy has the advantage of capturing all causes of disability across a population and relating these to life expectancy defined by mortality.

Disability-adjusted life years: the number of healthy years of life lost due to premature death and disability.

Disease prevention: disease prevention covers measures not only to prevent the occurrence of disease, such as risk factor reduction, but also to arrest its progress and reduce its consequences, once established.

Domestic violence: trauma resulting from fight between members of a household. It usually manifests in the form of use of power by male against the female residents of a house.

Dyslipidaemia: a condition in which there are abnormal levels of lipid and lipoproteins in blood and the ratio of various types of lipoproteins is also not normal.

Effectiveness: a measure of the extent to which a specific intervention, procedure, regimen or service, when deployed in the field in routine circumstances, does what it is intended to do for a specified population.

Efficiency: the capacity to produce the maximum output for a given input.

Effluents: the discharges of production.

Embryonic cell tumours: a type of cancer that arises from germ cells.

Embryonic: related to the embryo (the foetus).

Endemic: the constant presence of a disease or infectious agent within a given geographical area or the usual prevalence of a given disease within such area.

Epidemiology: the study of the causes and prevention of disease in populations or communities, making it the main source of evidence for public health decision making.

Evaluation framework: a description of how a programme is to be evaluated.

Evaluation of a programme: an assessment of how a programme achieves its effects. It includes evaluation of the amount of resource inputs used, as well as a description of activities implemented and of outputs (intermediate outcomes, proximal impacts) of the programme.

Evidence-based medicine: the use of agreed-upon standards of evidence in making clinical decisions for treating individual patients or categories of patients.

Evidence-based public health: the use of agreed-upon standards of evidence in making decisions about public health policies and practices to protect or improve the health of populations.

Experimental design: an experimental design seeks to ensure the initial statistical equivalence of a comparison (control) group and one programme (experimental) group through the random assignment of individuals to each group.

Experimental study: in an experimental study, the investigator directly controls conditions. In the field of epidemiology, an experimental study is one in which a population is selected for an intervention and the effects of the intervention are measured by comparing the outcomes in the experimental group with those in the control group. Ideally, the allocation of individuals to experimental and control groups is random.

Extrapolate: assume and predict on the basis of available information.

Fiscal: measures related to tax and tax policies.

Gastroenterology: the branch of medical science that deals with diseases of the digestive system i.e., esophagus, stomach, intestine, pancreas, liver and gall bladder.

Generalizability: the level at which the findings of a result can be attributed to a bigger population or the whole population of concern.

Glial cancers: cancers arising from neurological tissues.

Guidelines: systematically developed statements traditionally used to reinforce best practices.

Health: a state of complete physical, social and mental well-being and not merely the absence of disease or infirmity.

Health disparities: differences in the burden and impact of disease among different populations, defined, for example, by sex, race or ethnicity, education or income, disability, place of residence, or sexual orientation.

Health education: health education comprises consciously constructed opportunities for learning involving some form of communication designed to improve health literacy. It includes improving knowledge and developing life skills that are conducive to individual and community health.

Health promotion: the combination of educational and environmental supports for action and conditions of living conducive to health. The actions may be those of individuals, groups or communities, of policy-makers, employers, teachers or others whose actions control or influence the determinants of health. The purpose of health promotion is to enable people to gain greater control over the determinants of their own health. In health promotion, health is seen as a resource for everyday life, not the objective of living. Health is a positive concept, emphasizing social and personal resources, as well as physical capabilities.

Heart attack: an acute event in which the heart muscle is damaged because of a lack of blood flow from the coronary arteries, typically accompanied by chest pain and other warning signs but sometimes occurring with no recognized symptoms (i.e., *silent heart attack*).

Heart disease: any affliction that impairs the structure or function of the heart (e.g., atherosclerotic and hypertensive diseases, congenital heart disease, rheumatic heart disease, and cardiomyopathies).

High blood pressure: a condition in which the pressure in the arterial circulation is greater than desired; associated with increased risk for heart disease, stroke, chronic kidney disease, and other conditions; blood pressure is considered *high* if systolic pressure (measured at the peak of contraction of the heart) is greater than or equal to 140 mm Hg or if diastolic pressure (measured at the fullest relaxation of the heart) is greater than or equal to 90 mm Hg.

High-risk approach: in the present context, an intervention strategy that targets only people with the highest levels of recognized cardiovascular disease risk factors for the purpose of reducing their level of risk to that of the most favourable level in the population; distinct from and complementary to the population-wide approach.

Hukka: a device for smoking tobacco that is alike the Middle Eastern *hubble bubble*. Tobacco is heated in a pot and is made to pass through water cisterns before being inhaled through a long tube; the device is used for communal smoking.

Hyperplasia: an excess proliferation of cells of the human tissues resulting in an abnormal increase in the size of the tissues.

Hypertension: see *high blood pressure*.

Hypertensive heart disease: abnormality in the structure and function of the heart caused by long-standing high blood pressure; often manifests as heart failure.

Impact: in the present context, the total, direct and indirect effects of a programme, service or institution on the health status and overall health and socio-economic development.

Implementation plan: a list of activities to be organized or carried out, in a set order and according to a schedule, to accomplish a certain goal. The plan stipulates who does what and when, and may include information on the costs associated with each phase of the work. Implementation is also the act of converting programme objectives into actions, such as through policy changes, regulation and organization.

Implications: assumption or reference that is drawn from certain findings or results.

Incidence: the number of new cases of disease occurring in a population of a given size within a specified time interval.

Indicator: a variable with characteristics of quality, quantity and time. It is used to measure, directly or indirectly, changes in a situation and to appreciate the progress made in addressing it. It also provides a basis for developing adequate plans for improvement.

Individual approach: see *high-risk approach*.

Input: resources such as money, materials and the time and skills of staff and volunteers.

Institution: an organization or association established for the promotion of some object, especially one of public or general utility.

INTER-HEART Study: a global case-control study to identify the risk factors for acute myocardial infarction in different ethnic populations. The Study is sponsored by WHO, World Heart Federation and International Clinical Epidemiology Network.

Inter-sectoral action: in inter-sectoral action, the health sector and other relevant sectors collaborate to achieve a common goal. For practical purposes, inter-sectoral and multi-sectoral actions are synonymous.

Inter-sectoral collaboration: a recognized relationship between part or parts of different sectors of society which has been formed to take action on an issue to achieve outcomes in a way which is more effective, efficient or sustainable than might be achieved by one particular sector acting alone.

Intervention: an activity or set of activities aimed at modifying a process, course of action or sequence of events, in order to change one or several of their characteristics such as performance or expected outcome.

Leukaemia: disease condition resulting from an abnormal proliferation of cells in the bone marrow leading to an increased number of circulating white blood cells.

Life expectancy: the number of years of life that can be expected on average in a given population.

Lifestyle: a way of living based on identifiable patterns of behaviour which are determined by the interplay between an individual's personal characteristics, social interactions, and socioeconomic and environmental living conditions.

Living conditions: the everyday environment of people, where they live, play and work. These living conditions are a product of social and economic circumstances and the physical environment – all of which are largely outside the immediate control of the individual.

Malignancy: tumour in which the abnormal (cancerous) cells are transferred via different routes in the body at a rapid pace, invading and destroying normal tissue and the functions of that tissue.

Malnutrition: any disorder of nutrition. It may be due to unbalanced or insufficient diet or defective assimilation or utilization of food.

Mania: psychiatric disorder characterized by agitation, hyper-excitability, hyperactivity and increased speed of thought and speech.

Market intelligence: level of knowledge and information of various stakeholders in the market.

Mass media: all the impersonal means by which visual and/or auditory messages are directly communicated to the public. Examples of mass media include television, radio and newspapers.

Modifiable characteristics: factors that are amenable to change (e.g., diet, physical activity, and smoking), in contrast to those that are intrinsic to the individual (e.g., age, sex, race, genetic traits).

Monitoring: regular observation of changes in some condition, either in a population or an individual, such as health status, or in an environment, such as levels of pollution, in order to determine whether an initiative is proceeding according to plan. Monitoring includes keeping track of achievements, staff movements and deployment, supplies, equipment, and money spent. The information gained from monitoring is used in evaluating the initiative.

Morbidity: knowledge of the illness or diseased condition in a population. Various ratios are calculated to ascertain the morbidity level.

Mortality: rate of death expressed as the number of deaths occurring in a population of a given size within a specified time interval.

Naswar: orally used snuff.

Network: the number and types of social relations and links between individuals and/or institutions that may provide access to or mobilize social support.

Neurotrauma: injury involving brain or brain tissue (e.g., injury to head or spinal cord).

Nicotine Replacement Therapy (NRT): a type of pharmacological treatment used as an aid to smoking cessation. It includes devices such as trans-dermal (applied on skin) patches, nicotine gum, nicotine nasal sprays and inhalers.

Obesity: usually defined in terms of body mass index (BMI), which is calculated as body weight in kilograms (1 kg = 2.2 lbs) divided by height in meters (1 m = 39.37 in) squared; adults with a BMI of greater than or equal to 30.0 kg/m2 are considered *obese*, and those with a BMI of 25–29.9 kg/m2 are considered *overweight*. In children, overweight is defined as BMI greater than the 95th percentile value for the same age and sex group.

Oncology: the branch of medical science that deals with the detection, identification and treatment of cancer.

Opportunistic screening: the presumptive identification of unrecognized disease or defect by tests, examinations or other procedures which can be applied rapidly to sort out apparently well persons who probably have a disease from those who probably do not. This is done in a passive way at a health setting without having to go out to look for cases.

Orifices: openings, mouths, outlets.

Outcome: in the present context, a change in current or future health status or health-related behaviour that can be attributed to an intervention. In the field of health, the desired result or impact of a policy measure or other health intervention would be a positive change in health status or health behaviour.

Outcome assessment: an outcome assessment is used to determine the short-term effects of an intervention on an identified population.

Output: the products, services and other items, such as clinical preventive guidelines, regulations, tax law provisions, directly produced by a programme or organization.

Overweight: see *obesity*.

Paediatric: related to children.

Passive smoking: inhaling cigarette, cigar, or pipe smoke produced by another individual. It is composed of second-hand smoke (exhaled by

the smoker), and side stream smoke (which drifts off the tip of cigarette or cigar or pipe bowl).

Peripheral arterial disease: mainly atherosclerosis of the extremities; especially important in the lower extremities; also called peripheral vascular disease.

Physical inactivity: lack of habitual activity sufficient to maintain good health, resulting in an unfavourable balance between energy intake and expenditure and fostering the development of overweight or obesity and other risk factors for heart disease and stroke.

Planning: the process of defining needs, establishing priorities, diagnosing causes of problems, assessing resources and barriers, and allocating resources to achieve objectives.

Policy: an agreement or consensus among relevant partners on the issues to be addressed and on the approaches or strategies needed to deal with the issues.

Policy and environmental change: in the present context, an intervention approach to reducing the burden of chronic diseases that focuses on enacting effective policies (e.g., laws, regulations, formal and informal rules) or promoting environmental change (e.g., changes to economic, social, or physical environments).

Policy framework: a conceptual structure based on consensus among major stakeholders that shows the relationship.

Population-based data: health data that pertain to a defined, usually large, population (e.g., vital statistics, surveillance, results of population surveys).

Population-wide approach: an intervention strategy that targets the population as a whole with regard to the risk levels of various subgroups; distinguished from and complementary to the *high-risk approach*.

Prevalence: the frequency of a particular condition within a defined population at a designated time (e.g., 5.5 million men living with hypertension in 1994 or 34% of the population found to use tobacco in a survey conducted in Pakistan).

Prevention: in the present context, approaches and activities aimed at reducing the likelihood that a disease or disorder will affect an individual, interrupting or slowing the progress of the disorder or reducing disability. Primary prevention reduces the likelihood of the development of a disease or disorder. Secondary prevention interrupts, prevents or minimizes the progress of a disease or disorder at an early stage. Tertiary prevention focuses on halting the progression of damage already done.

Prevention research: in the present context, such research aims to prevent disease and promote health by developing and disseminating strategies applicable to public health programmes and policies.

Preventive dose: the intensity and duration of appropriate public health interventions needed to achieve their goals; similar to the dose and duration of medical treatment sufficient to control or cure an illness.

Primary health care: essential health care made accessible at a cost a country and community can afford, with methods that are practical, scientifically sound and socially acceptable.

Primary prevention: a set of interventions, including the detection and control of risk factors, designed to prevent the first occurrence of non-communicable diseases among people with identifiable risk factors.

Primordial CVD prevention: a set of interventions targeting people without risk factors or CVD (including the maintenance or restoration of favourable social and environmental conditions and the promotion of healthy behavioural patterns) to prevent development of risk factors.

Priority populations: in the present context, groups at especially high risk of cardiovascular diseases (e.g., those identified by sex, race or ethnicity, education, income, disability, place of residence, or sexual orientation).

Process evaluation: an assessment of how a programme achieves its effects. This includes evaluation of the amount of resource inputs used, as well as a description of activities implemented and of outputs (intermediate outcomes, proximal impacts) of the programme.

Profile: a set of data, often presented in graphic form, that portrays the most significant features of a situation, such as the extent to which individuals or groups exhibit certain traits or characteristics.

Programme: a set of projects designed to achieve common, long-term goals.

Programme evaluation: a periodic review and assessment of a programme to determine, in light of current circumstances, the adequacy of its objectives and its design, as well as its intended and unintended results.

Project: a group of planned activities linked by common short- to long-term objectives and managed by a single centre of responsibility.

Promotion: a representation about a product or service by any means, whether directly or indirectly, including any communication of information about a product or service and its price and distribution, that is likely to influence and shape attitudes, beliefs and behaviours about the product or service.

Psychosis: a behavioural disorder in which mental functioning is sufficiently impaired to interfere grossly with a patient's capacity to meet the ordinary demands of life.

Psychotropic drugs: drugs which exert an effect upon the mind, capable of modifying mental activity.

Qualitative data: qualitative data are categorical rather than quantifiable observations, and often involve descriptions of attitudes, perceptions, intentions and activity.

Quality of life: quality of life is defined as individuals' perceptions of their position in life in the context of the culture and value system where they live, and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept.

Randomized controlled trial: an experimental study of an intervention, most often a medical treatment, in which study participants are randomly assigned to treatment or comparison groups; much less often, communities rather than individuals are the units used to form treatment and comparison groups.

Rehabilitation: an intervention approach designed to limit disability among survivors of cardiovascular disease events and reduce their risk for subsequent events.

Retinal complications: damage to the nervous layer of the eye.

Retrospective: a comparison with regard to the presence of certain elements in the past.

Risk: the likelihood of incurring a particular event or circumstances.

Risk assessment: in the present context, a measure to determine the chance or probability of acquiring a disease. The excess risk caused by exposure to a given factor is calculated by incidence rates of disease in exposed and non-exposed populations.

Risk behaviour: in the present context, a behavioural pattern associated with increased frequency of specified health problems; for example, high salt intake, smoking, and binge drinking are all associated with CVD.

Risk factor: in the present context, an individual characteristic associated with increased frequency for specified health problems; for example, high LDL cholesterol, high blood pressure, and diabetes are all associated with CVD.

Risk factor detection and control: in the present context, an intervention approach that targets people with identifiable risk factors; includes both screening or other methods of detection and long-term disease management through changes in lifestyle, behaviour and medication, when necessary.

Schizophrenia: a type of major mental disorder.

Screening: in the present context, the identification of unrecognized disease or defect by the application of tests, examinations, or other procedures which can be applied rapidly to sort out apparently well persons who probably have a disease from those who probably do not. A screening test is not intended to be diagnostic.

Secondary prevention: in the present context, a set of interventions aimed at survivors of acute NCDs events (e.g., heart attack, heart failure, stroke etc) or others with known NCDs in which long-term case management is used to reduce disability and risk for subsequent NCDs events.

Sigmoidoscopy: a procedure to examine the lower part of the intestines (sigmoid colon).

Skill: the ability to use knowledge effectively and readily in the performance of a task.

Smoke-free areas: areas where smoking or holding a lighted cigarette, cigar or pipe, *berri*, *huqqa*, *chillim* is banned.

Social marketing: the development and implementation of programmes aimed at influencing people's ideas through the use of techniques and approaches similar to those employed in the marketing of goods and services, such as market research, product planning, communication and distribution.

Stakeholders: parties who have a common interest in a project and have agreed in principle to support it. Depending on their affiliation, they will provide assistance with technical, material, financial or human resources.

Strategy: a plan of action that is designed to achieve long-term goals, taking into account the resources available and barriers anticipated, as well as possibilities for collaboration among relevant stakeholders.

Stroke: sudden interruption of blood supply to the brain caused by an obstruction or the rupture of a blood vessel.

Sub-clinical disease: presence of one or more forms of disease detectable only by special examination and not recognizable from signs or symptoms expressed by the affected person.

Surveillance: a regular collection, summarization and analysis of data on a continuous basis. In the present context, surveillance involves the identification of high-risk groups in the population, understanding of mode of spread of disease and reduction or elimination of its transmission.

Survey: see *cross-sectional study*

Survival: remaining alive for a specified period.

Symptomatic: feeling and showing the discomfort and complaints of disease.

Validity parameters: sensitivity and specificity are the two main aspects of validity. Sensitivity of a test is defined as the ability of a test to identify correctly, those who have the disease. Specificity is defined as the ability of a test to identify correctly, those who do not have the disease.

Venomous: poisonous.

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