Non-communicable diseases: an update and implications for policy in low- and middle-income countries

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INTRODUCTION

Non-communicable diseases (NCDs) are increasingly recognised as the next big challenge for the health sector in low- and middle-income countries (LMICs). Since the UN High Level Meeting on NCDs, held in New York in 2011, many studies have identified the increasing contribution of NCDs and their underlying risk factors to the global burden of disease. These findings have implications for health services and systems, particularly in LMICs, where the prevalence of NCDs is rising, often surprisingly rapidly, and where the global debate on health systems has been mainly focused on communicable disease and maternal and child health.

This paper aims to update the current picture of NCDs globally on the basis of the new information on burden of disease, and to identify the implications for policy makers and development partners in regard to the current and forthcoming policy agendas. The paper draws out the implications of the increase of NCDs for health systems in LMICs, in particular their financing, service delivery and governance components, and raises the issue of how NCDs might be addressed in setting the post-2015 development agenda.

It draws on current debates in three areas and revisits the policy implications for managing the challenge of NCDs in LMICs. The three are:

- the release of the Global Burden of Disease 2010 study (GBD 2010);
- the forthcoming resolution of the WHO Executive Board (January 2013) on targets and indicators for monitoring NCDs at the national level;
- the impact of NCDs on health expenditure, as health systems move towards universal health coverage.

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1 Also see *Lancet* Vol 380, 15/22/29 December 2012, for more information; the Institute for Health Metrics and Evaluation website includes several interactive tools to present the data and analysis by country, region, gender, age group, risk factor and so on.
GLOBAL BURDEN OF DISEASE 2010

A New Version

A revised version of the Global Burden of Disease (GBD) study, released in December 2012, replaces all the previous versions of the past 20 years with newly calculated estimates for 1990 and 2010. The purpose of the GBD study is to present changing patterns of disease, death and ill health across countries and regions for gender and age groups during the period 1990 to 2010. The new version is the result of a global collaboration of almost 500 researchers from a variety of fields. For the first time, data sets are built for 187 countries combined into 21 geographic and economic regions to provide a new view of changing health patterns for these populations. This new report provides a revised version of causes of death, premature death, illness and the risk factors underpinning poor health, and the changes in patterns of ill health and its causes and risks over 20 years. The scope has expanded from 107 diseases and injuries and 10 risk factors used in the previous version to 235 causes of death and 67 risk factors. For the first time, uncertainty intervals for the results are calculated and reported (see the GBD 2010 web site for more information on the methods used). The new version supersedes all previous versions.

As do most global health statistics, GBD 2010 uses specific assumptions, underlying data sets and methods of analysis, which may differ from other studies. In some cases, the results differ from those reported elsewhere. While some of these differences are important, they need to be kept in perspective because they frequently do not result in estimates that are all that different in either scale or complexity, especially when the levels of uncertainty are taken into account. However, these differences do highlight the continuing problems associated with poor quality of data collection in some parts of the world. They also reinstate the point that global disease estimates should always be considered alongside national data sets and other local knowledge.

The new GBD achieves new standards in defining data and methods for analysing and modelling. For the first time, it facilitates systematic comparisons between countries for benchmarking purposes, so exposing who is doing better than expected in what areas and who is doing not as well.

What Do We Learn from GBD 2010?

Globally, comparing 1990 with 2010, people are living longer, but they live longer in periods of increasingly poor health. The major areas of ill health have shifted from children to adults. The causes have changed from communicable diseases and maternal and child health conditions to NCDs (in their broadest definition2), and the shift is occurring in every region of the world, with some variation in degree and locally specific patterns.

It is these broad changes that are of interest to policy makers in the development sector because they have consequences for both the overall demand for health services and the manner in which health services are delivered. One important example is the need for greater emphasis on prevention and early intervention.

In the period 1990 to 2010 there has been a 70 per cent decline in child mortality in the world, indicating that efforts in this area have saved lives. While the degree to which this is linked to the focus on Millenium Development Goal (MDG) 4 (which aims to reduce the under-five mortality rate by two-thirds between 1990 and 2015) can be argued, it appears that it has been largely successful. In absolute terms, there are of course still large numbers of children under five years dying, which means that recent efforts need to be maintained. However, from a policy perspective, this demonstration of positive health impacts in some areas suggests that it is possible for donors and governments to intervene on important measures of global health and, just as importantly, that these lessons may be applied elsewhere.

There are 60 million people who die each year before they need to, often from causes that are largely preventable. This premature death or avoidable mortality in LMICs is a big development problem. This raises the question: are we putting our effort in the right place to deal with the real challenges? The GBD study indicates that the causes of premature death have changed significantly and rapidly, and that the speed of change varies in different parts of the world. The

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2 GBD 2010 uses WHO disease classifications—Group I: infectious and communicable, Group II: non-communicable diseases of all types, Group III: injuries.
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GBD data also indicate that some countries more than others have been successful in addressing causes of premature deaths.

The top four risks for adults aged over 50 years in both 1990 and 2010 were high blood pressure, tobacco smoking including second-hand smoke, alcohol use and a diet low in fruits (p. 2247). The authors also note that, while the shift from childhood and communicable disease risk factors to risk factors for NCDs was observed in all parts of the world, the size of the shift and the nature of the risk factors varied between regions. Looking at five regions that are likely to be of interest to Australia from the aid perspective, patterns can be seen that have not been evident in previous analyses.

Key messages from GBD 2010 include:

- Patterns of ill health and causes of death in many regions of the world are changing rapidly, including several positive changes such as overall decrease in child mortality and risks driving premature mortality.
- The increase in the level of poor health and early death in adults is linked to preventable causes associated with the five key metabolic and dietary risk factors of high blood pressure, high body mass index, high fasting plasma glucose, high alcohol use and poor diet. This increase is the result of a combination of ageing populations, mortality reduction among children under five years and changes in risk exposure.
- Gains in healthy life expectancy between 1990 and 2010 appear to have been the result of reducing child and adult mortality, as opposed to treating illness and injury or curing disease.
- Co-morbidities play an important role in various health conditions, particularly among the four main NCDs and mental health.
- The new grouping of countries into 21 regions by socio-economic criteria confirms that NCDs are prevalent even in poor countries, although data on the relative burden among the poor and rich of these countries are not presented.
- Global patterns mask much regional variation and even sub-national variations in exposure to risks, and the health consequences of that exposure need to be better understood by applying the standardised methods developed by GBD 2010. This is an important area for further research and support.

The view of the health situation presented in GBD 2010 has some differences with other reports on estimates of specific diseases and health conditions by organisations like the World Health Organization (WHO), the Global Fund and UNAIDS, as well as disease-specific programs like Roll Back Malaria, Vision 2020 and the like. These differences highlight the difficulties for policy makers faced with apparently contradictory estimates. However, these differences should not be seen as an excuse for delaying action, but rather as a reason for investing in better monitoring and reporting.

Again, for decision makers in development assistance, who focus on targeting the needs of the poorest, the new grouping of countries into 21 regions by socio-

### Table 1. Top Five Risk Factors for Disease in Five Selected Regions

<table>
<thead>
<tr>
<th>Australasia</th>
<th>East Asia</th>
<th>South Asia</th>
<th>South-East Asia</th>
<th>Oceania</th>
</tr>
</thead>
<tbody>
<tr>
<td>High body mass index</td>
<td>High blood pressure</td>
<td>Household air pollution from solid fuels</td>
<td>High blood pressure</td>
<td>High fasting plasma glucose</td>
</tr>
<tr>
<td>Tobacco smoking including second-hand smoke</td>
<td>Tobacco smoking including second-hand smoke</td>
<td>Tobacco smoking including second-hand smoke</td>
<td>Tobacco smoking including second-hand smoke</td>
<td>High body mass index</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>Diet low in fruits</td>
<td>High blood pressure</td>
<td>Household air pollution from solid fuels</td>
<td>Tobacco smoking including second-hand smoke</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>Ambient particulate matter pollution</td>
<td>Childhood underweight</td>
<td>Diet low in fruits</td>
<td>Household air pollution from solid fuels</td>
</tr>
<tr>
<td>Physical inactivity and low physical activity</td>
<td>Household air pollution from solid fuels</td>
<td>Diet low in fruits</td>
<td>High fasting plasma glucose</td>
<td>Alcohol use</td>
</tr>
</tbody>
</table>

The nine voluntary targets are the result of extensive discussions between member states since the meeting in 2011 and, if agreed, will be integrated into the next draft of a WHO Global Action Plan 2013-20 that is planned for submission to the World Health Assembly in May 2013. Table 2 lists these targets. Countries are required to apply both targets and their indicators as appropriate. Achievement of these targets by 2025 would represent major progress in the prevention and control of NCDs.

The World Health Assembly has already agreed on an overall target of a 25 percent reduction in global premature deaths due to the four NCDs by 2025. Agreement on these targets and their indicators represents an important step in NCD control and a key achievement agreed by countries at the High Level Meeting in 2011. Some would argue that while they remain voluntary, the targets will always lack teeth. Another view would be that, given the complexity and fragmentation of the issues involved in NCD control, they represent a remarkable degree of consensus across countries in a relatively new policy process. Either way, many LMICs will find it very difficult to

**WHO NCD VOLUNTARY TARGETS AND INDICATORS**

In January 2013, the executive board of the WHO released draft recommendations on a framework of voluntary indicators and targets for monitoring and reporting on the four key NCDs: cardiovascular diseases, cancers, diabetes and chronic respiratory diseases. These conditions were included in the definition of NCDs used in the UN High Level Meeting on NCDs of 2011 (UN General Assembly 2011) and the WHO (2010) report on the global status of NCDs.

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**TABLE 2. NINE VOLUNTARY GLOBAL TARGETS FOR PREVENTION AND CONTROL OF NCDs**

<table>
<thead>
<tr>
<th>Component: mortality and morbidity</th>
<th>Voluntary Global Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Premature mortality from NCDs</td>
<td>A 25% reduction in overall mortality from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component: risk factors</th>
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</thead>
<tbody>
<tr>
<td>Behavioural risk factors</td>
</tr>
<tr>
<td>2 Harmful use of alcohol</td>
</tr>
<tr>
<td>3 Physical inactivity</td>
</tr>
<tr>
<td>4 Salt/sodium intake</td>
</tr>
<tr>
<td>5 Tobacco</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biological risk factors</th>
</tr>
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<tbody>
<tr>
<td>6 Blood pressure</td>
</tr>
<tr>
<td>7 Diabetes and obesity</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Component: national systems response</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Drug therapy to prevent heart attacks and strokes</td>
</tr>
<tr>
<td>9 Essential medicines and basic technologies to treat major NCDs</td>
</tr>
</tbody>
</table>

Source: WHO 2012b.
establish appropriate national baseline data and are likely to require considerable technical assistance to implement the targets. It will be interesting to see if traditional donors will be willing to offer financial and knowledge resources to assist in this. In the debate on these targets, developed countries showed far more concern about their own reporting, and showed scant attention to the needs of LMICs in carrying out the necessary surveillance and reporting. Both the GBD 2010 and the previous Global status report (WHO 2010) have noted the lack of good systematic information on NCDs available from many national health surveys in LMICs. Monitoring the efforts of various players, the key development partners for example, in providing technical and financial assistance in coming years will also be an important area of research. The tracking of resources dedicated to surveillance and the consequent reporting of national data sets will be important indicators of global commitment to tackling NCDs in LMICs.

**DISCUSSION**

**Implications for Health Systems Financing**

The rise of NCDs in LMICs will require increased financing for both prevention and treatment. With a large proportion of NCDs being preventable, the challenge for health financiers is to resource both prevention and treatment at the same time, and to continue to do this until the investment in prevention pays off. Efforts in places like Finland, Australia and Wales indicate that this needs to be sustained over long periods to produce inter-generational change. It also requires rigorous monitoring and evaluation to build the evidence base required to sustain the effort.

Recent European Union and OECD data indicate that between 70 and 80 per cent of health care costs are spent on chronic NCDs in developed countries and that less than 3 per cent of this is targeted at prevention. Health costs are also rising in these high-income countries. Such patterns of financial allocation are clearly not desirable or even possible for most LMICs, where per capita expenditure on health is much lower. As developed countries seek to contain their health care costs, LMICs stand to learn much about cost-effective practices. The reverse is also true—the opportunity to develop innovative cost-effective solutions in LMICs is very promising.

In the current moves by the World Bank and WHO to promote universal health coverage, the degree to which the transition to NCDs is being taken into account in funding models is unclear.

The most recent overview of overseas development assistance (Wexler, Valentine and Kates 2013) indicates that it is still very difficult to track donor financial and technical assistance to NCDs in LMICs. For example, NCDs are not even mentioned in this report. Many governments, particularly those in LMICs, still do not report national health expenditure on NCDs as a separate budget line, and nor do major aid donors. However, the major issue remains that the increase of NCDs in LMICs will have both macro- and microeconomic impacts, particularly on the poor. This will need to be addressed alongside the ‘unfinished business’ of communicable diseases and maternal and child care in many LMICs. The size and scale of the NCD burden in many countries indicates that programs to help the poor will increasingly need to consider NCDs. Premature deaths attributed to NCDs in LMICs often strike those who are the most economically productive—between 50 and 65 years, for example. With an ageing population in some countries, the decline of the proportion of the population in work, together with the rising costs of care, will stretch welfare systems.

**Service Delivery**

The transition to NCDs as a driver of so much ill health in LMICs has several implications for service delivery beyond the rise in demand. These include several shifts in thinking about delivery models:

1. The need to think of packages of treatments given the complex co-morbidities that arise with many NCD conditions, particularly when mental health is included. This requires much more research, but it seems that the management and control of the ‘core’ NCDs, namely, cardiovascular diseases, diabetes, chronic respiratory disease and tobacco-related cancers, is more effective when a more integrated approach is taken, as opposed to one where each disease is tackled independently.

2. The need to shift more effort to prevention and early intervention in the community and away from
in-patient treatment to reduce both financial costs and patient suffering.

3. With ageing populations in LMICs, the increase in the number of individuals living with some level of ill health from middle age, altering the nature of demand for health services.

4. The need for a shift in orientation in health systems from treatment of illness and disease to maintaining good health, with increased emphasis on patient self-management and promoting healthy behaviours. This is a huge shift for many health bureaucracies and communities; to be successful it also requires the health system to partner with a range of other players in government and civil society to deliver services.

**Governance**

*Multi-sectoral action and governance*

The Political Declaration of the High Level Meeting on NCDs clearly lays out the need for multi-sectoral action in the control and prevention of NCDs. Governments will need to take action in areas of public policy beyond traditional health systems and coordinate across other areas, including education, agriculture and trade, to avoid the unaffordable costs of relying on treatment alone. This multi-sectoral approach implies coordination through some form of governance structure.

Two recent studies (Alam, Robinson et al 2013; Snowdon, Gade et al 2013 in press) in LMICs indicate how difficult it is to drive national NCD control efforts from the Ministry of Health (MOH) alone. While health ministries can be effective, there are many areas of public policy vital to NCD control, such as trade, agriculture and urban planning that are beyond their sphere of influence. But without more effort in this area, positive results in tackling NCDs are unlikely. This is an important area for sharing of knowledge and experience between countries. Documentation of successful practices is needed, particularly those that critically examine the role of key players, how they work collaboratively and are accountable for outcomes.

*Quality of service delivery and governance*

Issues related to governance in mixed health systems, where public service provision with and without user fees sits alongside private for-profit and not-for-profit service provision, will be exacerbated by the burden of NCDs and the need to coordinate and plan for these services.

Where there is insufficient funding from government to deliver subsidised public or private services, a weak regulatory environment and a lack of transparency and accountability, the provision of inappropriate, poor quality and unnecessary services can grow. We are already seeing this in some LMICs, where private clinics provide services mainly to those who can afford to pay.

The quality of treatment services will be an ongoing issue for LMICs as demand for skilled, affordable services rises.

**Implications for the post-2015 Development Agenda**

In the formal process being led by the UN to build consensus on ‘sustainable development goals’ in the post-2015 period, only one of the nine working groups is devoted to health. While this does not mean that health will not be considered, there is a worry that the role of health in overall development may not be adequately considered.

The so-called global financial crisis has shifted the attention of many bilateral donors to more domestic concerns in the past five years. Perhaps their concern over their own rising health care costs will spill over into the development agenda. The recent report analysing the financing of global health (IHME 2013) asks whether we have reached the end of the ‘golden age’ of increases in funding of development assistance to health, as it tracks the plateauing of financial assistance in 2010-11.

While there is no real consensus on the measurable contribution of the MDGs to improving health outcomes, there is broad agreement that the MDGs’ main value was in focusing attention on and coordinating efforts towards a limited number of goals. The health development sector has been criticised for its fragmentation, complexity and diversity of players, but the outcome in reducing rates of maternal and child mortality in many parts of the world is evident in GBD 2010. Perhaps the response to NCDs is more complex than maternal and child mortality because it involves broader sections of society, including transnational companies that profit from the sale of alcohol, tobacco
products and certain foods, together with those who seek to regulate their activities. This situation makes governance more complex but also more compelling in the controlling of NCDs in LMICs.

CONCLUSIONS

The release of GBD 2010 reinforces the need to tackle NCDs. The changes in patterns of premature death and ill health between 1990 and 2010 in various regions described in the study indicate the extent of their contribution. The demographic changes, changes in life style, ageing of populations and increases in the risk factors driving NCD prevalence in most parts of the world are evidence of the scale and complexity of the problem. The study reinforces the need for the global and national actions set out in the Political Declaration of the 2011 High Level Meeting on NCDs. The likely agreement of member states on a framework of indicators and targets for monitoring the progress of NCDs at the World Health Assembly in May 2013 is another indicator of progress in the right direction.

But the core issue is that, to quote a recent CDC report from the USA (Anderko, Roffenbender et al 2012) ‘Real health reform starts with prevention’. Both the new evidence from GBD 2010 and the likely agreements to the voluntary country targets for monitoring NCDs support and enhance this need for health sector reform.

At the same time, this reform needs to go hand in hand with other changes for policy makers. The kind of multi-sectoral approaches required to control NCDs effectively need to be forged by health policy makers. The recent WHO strategy ‘Changing Mindsets’ (WHO 2012a) calls for greater collaboration between researchers and policy makers to drive health system transformation and strengthening. In a post-2015 environment, however, health priorities will need to change. The role of NCDs, particularly their contribution to increasing the demand for health services and changing the nature of that demand, will be dramatic. Ministries of health, as well as their financiers and planners, will need to look at putting greater emphasis on prevention and early intervention. Schemes for universal coverage and welfare support in LMICs will need to take into account the changes in demand for health services, the drivers of ill health and ageing of their populations and consider carefully the kinds of incentives they provide for maintaining good health.

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3 See for example the introduction of plain packaging of cigarettes in Australia on 1 December 2012.
REFERENCES


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