Medicus Mundi Schweiz
Netzwerk Gesundheit für alle
Réseau Santé pour tous
Network Health for All

MMS Bulletin #106
Chronische Krankheiten

Figures and recommendations

The neglected epidemic of chronic disease

Von Edward Chu, Lee Goeddel, Gerard Anderson

In May 2007, the World Health Organization Director General, Dr. Margaret Chan, stated: "Chronic diseases, long considered the companions of affluent societies, now impose their greatest burden in low and middle-income countries… The distinction between the health problems of rich and poor countries is no longer absolute." (1) Until recently, the prevalence and economic costs of non communicable chronic diseases have remained largely neglected by international aid agencies whose focus has been interventions aimed primarily at preventing and treating infectious diseases.

In response to the shifting burden of disease, the WHO has developed an action plan for non communicable chronic disease (NCD) surveillance, prevention, and control and has urged member states to devote more resources to NCD prevention and treatment. In 2007, the World Bank joined the WHO in calling for more resources devoted to NCD management, a position shared by a small but growing number of international agencies. (2) A recent article in the New England Journal of Medicine argued that private foundations such as the Gates Foundation should devote more resources to NCDs and a billionaire in Mexico just announced that he would devote 500 million US$ to prevention and treatment of chronic disease in Mexico. (3)

To respond to the growing burden of non communicable chronic diseases, international health organizations and national governments are beginning to revise their assistance programs to help low and middle income countries cope with the increasing burden of NCDs. Considerably more assistance will be needed in order to achieve the new goals of several international agencies of reducing the burden of NCDs by 2 percent per year over the next ten years in a cost effective manner. (4)

The figures

Recent studies have shown that non communicable chronic diseases represent a significant proportion of the burden of disease in low, middle, and high income countries. The WHO Burden of Disease Project (2002) divides all causes of world wide (loss of) disability adjusted

life years (DALYs) into four categories – infectious diseases, injuries, the category including maternal, perinatal and nutritionally related diseases, and finally non communicable disease. DALYS were chosen as the burden of disease measure because DALYs take into account both premature deaths and loss of functioning.

Infectious diseases: All infectious diseases, which include infectious, parasitic, respiratory, and all other communicable diseases accounted for 30% of worldwide DALYs in 2002. Infectious diseases posed the most significant burden of disease in Sub Saharan Africa where they accounted for 61% DALYs and 63% deaths. In all world regions outside of Sub Saharan Africa, all infectious diseases only accounted for 20% worldwide DALYs and 17% of deaths. Furthermore, as the availability of highly active anti-retroviral therapy increases in Sub-Saharan Africa, treatment of AIDS will require a paradigm shift towards chronic disease management.

Injuries: Injuries also contributed a significant global burden of disease in 2002 with 12% global DALYs. In all regions road traffic accidents were most prevalent while poisonings, fires, falls, and drownings contributed differently across regions. In Middle East and North Africa, for instance, falls played the second most important role while poisonings ranked second in Europe and Central Asia. Injuries were particularly prevalent in the European and Central Asian region where they were responsible for 17% of total regional DALYs.

Maternal, perinatal and nutritional diseases: The fourth category of disease, maternal, perinatal and nutritional disease, accounted for 11% worldwide DALYs in 2002. Maternal hemorrhage, maternal sepsis, low birth weight, birth asphyxia and birth trauma, protein-energy malnutrition, and iron-deficiency anemia all played significant global roles with no significant differences across regions.

Non communicable diseases: In 2002, non communicable chronic diseases were the leading cause of DALYs in all regions of the world except for Sub Saharan Africa. NCDs accounted for 47% DALYs and 53% worldwide deaths in 2002 and the prevalence of NCDs is projected to increase considerably over the next 20 years. (5) As shown in the studies, NCDs affect the regions of Latin America and the Caribbean, South Asia, Middle East and North Africa, Europe and Central Asia, and East Asia and Pacific significantly more than injuries, all infectious diseases, and the fourth major disease category (perinatal, maternal, and nutritional diseases).

Across the regions specific non communicable chronic diseases are important targets of opportunity because of their high burden of disease and the potential for low cost prevention and treatment methods. Cardiovascular disease was responsible for 26% of all deaths and 10% DALYs in 2002. Recent data from 2005 suggests that 30% of all deaths are now attributable to cardiovascular disease. (5) The lower-middle and low income countries (countries with a per capita gross national product of less than 3,255 US$ in the year 2004) demonstrated a similar burden of disease for cardiovascular disease in 2005 (27% of all deaths and 9% of all DALYs). Chronic respiratory diseases were responsible for over 7% of global deaths and 4% of all disability adjusted life years in 2002. 80% of the deaths attributable to chronic respiratory

diseases, most notably chronic obstructive pulmonary disease and asthma, occurred in middle and low income countries. (5) Diabetes accounted for over 5% of all worldwide deaths and 2% of DALYs in 2002.

No risk of contagion...

In recent history, international aid agencies have given little attention to the prevention and treatment of non communicable chronic diseases. Tuberculosis, human immunodeficiency virus (HIV) infection, and malaria have garnered the most attention and money from international donors. As this article will show there are good and less compelling reasons for this orientation. However, these three infectious diseases together only account for 10% of deaths worldwide (12% in low income countries) and 11% of the disability adjusted life years (13% in low income countries). (6) The burden of these three diseases does not warrant the resources they receive across the world except in Sub Saharan Africa where they collectively result in 33% of all deaths and 31% DALYS. International aid agencies attempting to reduce the burden of disease in the world in the most cost effective manner may want to reassess their funding strategies. This does not mean spending less on infectious diseases, simply using any additional resources to prevent and treat chronic diseases.

The current focus on infectious diseases can be traced back to the early 1900's, when infectious diseases caused the highest burden of disease in rich and poor countries alike. As the 20th century progressed, significant improvements in medicine and public health occurred. Improvements in sanitation, living conditions, immunizations, and antibiotics dramatically decreased the burden of infectious disease in high income countries. With this evidence of success in reducing the burden of infectious disease, it is logical that the leaders of high income countries used their international aid money to target infectious diseases in low income countries.

Some infectious diseases have become known as neglected diseases because they no longer exist with any significant prevalence in high income countries. When directing funds, policymakers in wealthy countries are drawn to treating diseases like leprosy or lymphatic filariasis because of success in eradicating these diseases in their own countries. Public health leaders are sympathetic to neglected diseases like onchoceriasis (river blindness) and human african trypanosomiasis (sleeping sickness) because of their horrific pathologies and recognition that the populations they affect lack sufficient purchasing power to attract investment in research and treatment.

Funding from international donors has created a market for investing in treatments for these neglected diseases that would not otherwise exist and it has also maintained a market for treatments that have proven efficacious against these diseases. The pharmaceutical industry bases their research, development, and production on treatments that will return a profit. Since these treatments usually target diseases in those countries that will pay high prices, diseases that no longer exist in high income countries might not have a sufficient profit margin to generate the necessary research and development in spite of the high burden of disease.

Some public health leaders have focused attention and resources on infectious diseases that can cause major epidemics, especially those that could spread to their own country. A current example is the global focus to prevent a pandemic of avian influenza, AIDS, and TB. In contrast, the current epidemic of obesity and consequently of diabetes poses no risk of contagion.

The possibility of a "permanent fix" also makes preventing and treating infectious diseases attractive to those responsible for dispersing international aid, especially those like Bill Gates who have a technology background. Vaccination programs, for instance, may only require a single investment with the promise of permanent eradication of the disease (for example smallpox). Tackling NCDs, however, is unlikely to have the possibility of a quick fix and treatment can require ongoing care that may last a patient's lifetime.

Sympathy also influences policymaking and funding. Pictures of celebrities visiting HIV positive children in low income countries are increasingly common. These images capture the public's awareness and appeal to our conscience. In contrast, an obese 40 year old man with poorly controlled hypertension who is at high risk of stroke would not be nearly as photogenic. The image is less compelling to the public, even though the well being and happiness of his son, his daughter, and his wife might depend on his health and ability to work.

Confronting the myths

Certain myths about non communicable chronic diseases have may be responsible for decreased interest in NCDs.

The first myth is that chronic conditions only affect affluent nations. As shown a substantial burden of disease occurs in low and middle income countries. Even in Sub Saharan Africa where infectious diseases exert the greatest impact, non communicable chronic diseases contribute substantially to the disease burden, an impact that is growing rapidly.

A second myth is that NCDs only affect the elderly. Data from a 2005 WHO report estimates that one quarter of all people worldwide who died from chronic disease were younger than 60 years of age. These data also suggest that NCDs have an important impact on the workforce, and, as a result, on economic productivity of low and lower middle income countries. The chronic nature of these diseases amplifies their consequences on families. Long term treatment depletes savings and often requires a family member to leave school or work to function as a primary caregiver. The WHO projects that China, Russia, and India may lose from $200 billion US dollars to $550 billion over the next 10 years from the effects of heart disease, stroke, and diabetes on patients and their families. (5)

A third myth contends that treatment and prevention programs that target chronic diseases are significantly more expensive than programs aimed at infectious diseases. Recent reports, however, outline low cost and cost effective NCD interventions that have been implemented in countries with high, middle, and low incomes.5,8 Unfortunately some lower middle and low income countries continue to invest in infectious disease programs with

relatively high cost effectiveness ratios. One example is the ongoing treatment of latent tuberculosis in patients without HIV (4,129 to 5,506 US$ per DALY), while more cost effective intervention programs to treat cardiovascular disease with beta-blockers and aspirin (9 to 273 US$ per DALY averted) struggle for funding. (8)

A WHO report documents these and other myths in its report on widespread misunderstandings about the reality of chronic diseases. Other myths are that NCDs primarily affect men, are always the consequence of unhealthy lifestyles, and only affect the rich in poor countries. (5)

Cost effective interventions

We have recently started a review of the interventions in Latin America that have targeted NCDs to help USAID identify the most cost effective programs, an effort we recently completed for Eastern Europe. Most of the examples of cost effective interventions we will use will be drawn from these studies. (7) Our objective is to identify programs that were clinically efficacious, cost effective, and were sustained beyond the initial funding.

Interventions for cardiovascular disease have been successfully applied in Latin America. The most simple treatment with beta-blocker and aspirin has been shown to substantially reduce cardiovascular events and blood pressure while demonstrating high cost effectiveness (less than 25 US$ per disability adjusted life year (DALY averted). (8) During 2000-2002 an international team established a hypertension treatment program with a surveillance and education component in rural Ecuador. The results demonstrated clinical effectiveness, cost effectiveness and have been sustained once the original demonstration program ended. An evaluation of the program found that after 18 months in a population of 4284 adult patients the percentage of grade II hypertensive patients dropped from 34% to 25% and the percentage of grade III hypertensives dropped from 35% to 29%. (9)

Chronic respitory disease: Tobacco is the single most important determinant of chronic respitory disease and a major risk factor for many other chronic diseases. Levying a 33% tax increase on tobacco is highly cost effective in improving health (13 to 195 US$ DALY averted) while simultaneously generating tax revenue, especially in low income countries.8 Despite a plethora of evidence linking tobacco control legislation around the world to reduced tobacco consumption, lower income countries have been reluctant to enact these policies citing concern about negative economic impact and smuggling. Cost effective programs have also dealt with asthma, a chronic respitory disease affecting 300 million people worldwide. In 2002, the Brazilian ministry began providing free drug therapy to asthmatics. Economic analysis after the first year demonstrated that the province of Salvador experienced 55% fewer hospital submissions, and families of severe asthmatics experienced a 10% increase in income. (5)

Diabetes programs focusing on glycemic control, blood pressure control, and foot care have all demonstrated the potential to be both effective and viable. (9) In 2000, an intervention named PENDID-LA started in Argentina and became a partnership program in hospitals

across nine other Latin American countries. It included patient education and treatment programs that targeted lifestyle, glycemic control, and blood pressure management. The program succeeded in decreasing fasting blood glucose, body weight, systolic blood pressure, and blood triglycerides. The savings in future drug therapies and glucose monitoring of the participants were estimated to be approximately 160 US$ per person per year. (10) This figure does not capture the savings from avoiding more extensive medical care and DALYs averted by preventing further diabetic complications. Similarly, in the Costa Rican primary healthcare system, public health officials used a methodology to evaluate patient education on diabetes in El Guarco, Costa Rica. Based upon the pilot results, they designed and implemented a diabetes education program for patients at primary care centers. After one year, the average fasting blood glucose of the patient population decreased from 189 mg/dl to 157 mg/dl. (11)

Lifestyle interventions: In many middle and low income countries worldwide and in Latin America, specifically, there has been a recent broad based push to broaden the scope of NCD intervention to population based primary prevention. Recent programs have sought to decrease NCD risk factors through lifestyle interventions. For example, from 1999 to 2002, the Brazilian program, Agita Sao Paulo, used extensive media campaigns; built strong community partnerships; and held public events to successfully integrate physical activity and health awareness into Brazilian popular culture. At an estimated 1 cent per person, the program has been implemented as a cost effective model to promote physical activity and has served as the model for similar programs in eleven other Latin American countries.

Establish and sustain an effective response

As international health agencies and national governments begin to recognize and confront the substantial global burden of NCDs, more resources must be directed to cost effective NCD interventions. Cost effective programs must be designed that will work in low and lower middle income countries. For the continued improvement of these programs, international aid agencies must draw on the successes of current examples in the low and lower middle income countries and more work must be done to introduce chronic care interventions from high income countries to low and lower middle income countries. Additionally, training in leadership and technical assistance for governments, if pursued, will be the foundation on which to establish and sustain an effective response to the growing burden of chronic non communicable disease.

**Gerard F. Anderson, PhD is a professor of health policy and management and professor of international health at the Johns Hopkins University Bloomberg School Public Health, professor of medicine at the Johns Hopkins University School of Medicine, director of the Johns Hopkins Center for Hospital Finance and Management, and co-director of the Johns Hopkins Program for Medical Technology and Practice Assessment. Dr. Anderson is currently conducting research on chronic*

conditions, comparative insurance systems in developing countries, medical education, health care payment reform, and technology diffusion. He has directed reviews of health systems for the World Bank and USAID in multiple countries. Contact: ganderson@jhsph.edu

Lee Goeddel is a second year medical student at the Johns Hopkins University School of Medicine.

Edward Chu MPH, MD Candidate is a medical student at Johns Hopkins University School of Medicine. Prior to coming to Hopkins, Edward was the Deputy Director for the Robert Wood Johnson Community Health Leadership Program. Contact: echu@jhmi.edu

References

1. WHO sixtieth Health assembly transcripts. Dr. Margaret Chan. 15 May, 2007. Geneva, Switzerland.
2. World Bank. Public Policy and the Challenge of Non Communicable Diseases. June 27, 2007. Washington, DC.
3. Braine, Theresa. Mexican billionaire invests millions in Latin American health. Bulletin of the World Health Organization. Volume 85, Number 8, August 2007. Geneva, Switzerland.
4. WHO. Eleventh General Programme of Work. May 2006. Geneva, Switzerland.
5. Preventing chronic diseases: a vital investment – WHO global report. Geneva: World Health Organization, 2005.
6. Anderson, GF, Chu, E. Expanding Priorities – Confronting Chronic Disease in Countries with Low Income. New England Journal of Medicine. January 2007. 357: 209-211.
7. Anderson, Gerard F., Hyder, Adnan A. Non Communicable Disease and Injuries in Eastern Europe and Eurasia. USAID. October 2006.
8. Disease control priorities in developing countries. 2nd ed. Washington, DC: World Bank, 2006.
9. Anselmi, M, Avanzini, F et. Al. Treatment and control of arterial hypertension in a rural community in Ecuador. Lancet. April 5; 361 (9364): 1186-7.
10. Gagliardino, JJ, Etchegoyen, G et. Al. A Model Educational Program for People with Type 2 Diabetes. Diabetes Care. 24: 1001-1007, 2001.
11. Arauz, AG, Sanchez G, Padilla G. A community diabetes educational intervention at the primary care level. Revista Panamericana Salud Publica.

Kontakt

Deutschschweiz
Medicus Mundi Schweiz
Murbacherstrasse 34
CH-4056 Basel
Tel. +41 61 383 18 10
info@medicusmundi.ch

Suisse romande
Route de Ferney 150
CP 2100
CH-1211 Genève 2
Tél. +41 22 920 08 08
contact@medicusmundi.ch