HLTH 230: Global Health: Challenges and Responses
Professor Richard Skolnik
Teaching Fellow: Nidhi Parekh

By submitting this essay, I attest that it is my own work, completed in accordance with University regulations. —Sudhakar Nuti

Cardiovascular Disease in China

by Sudhakar Nuti

From: Honorable Li Bin, Minister for Health
To: Honorable Lou Jiwei, Minister for Finance

Introduction:
Cardiovascular Disease (CVD) is the leading cause of mortality in China.[1] CVD primarily affects rural, poor, low-educated Chinese who live in the North. The leading risk factors for CVD are tobacco consumption, inappropriate nutrition, and reduced physical activity.[2] CVD is associated with impaired neuropsychological function, household impoverishment, and economic losses in the form of loss of productivity. To immediately and efficiently address this issue, China must increase tobacco taxation, implement educational campaigns to reduce smoking, and reduce salt consumption.

Nature and Magnitude of the Problem:

Cardiovascular Disease (CVD) is the leading cause of mortality in China.[3] CVD is a group of disorders that involve the heart and blood vessels, principally coronary heart disease, cerebrovascular disease, and peripheral arterial disease.[4] These disorders also lead to acute events that are categorized under CVD, such as acute myocardial infarction (AMI) and stroke.[5] In China, an estimated three million deaths occur due to CVD annually, which accounts for 40% of all deaths.[6] Additionally, an estimated 230 million, approximately 20% of Chinese people, have CVD.[7] The annual number of CVD events will increase by more than 50% per year between 2010 and 2030 based on aging and population growth alone.[8] Above and beyond the demographic effects, an additional 21.3 million CVD events and 7.7 million deaths will occur between 2010 and 2030 if projected trends in blood pressure, total cholesterol, diabetes, and active smoking do not change.[9]

Affected Populations:

CVD primarily affects rural, poor, low-educated Chinese who live in the North. CVD mortality rate in rural areas is 252.86/100,000 (a 32.18/100,000 rise since 2004), while in urban areas the rate is 217.50/100,000 (a -11.56/100,000 fall since 2004).[10] Low education and low-income are closely associated with increased risk of AMI in China: the lowest income groups have an odds ratio of 1.19 compared to the highest income group (1.00), and those with less than 8 years of education have an odds ratio of 1.53 compared to those with a higher education (1.00).[11]

In addition, Chinese with low incomes, low education, and who live in the Northern region have higher levels of CVD risk factors, such as tobacco consumption, high blood pressure, and high body mass index.[12] For example, those with the lowest incomes are 1.4 times more likely to be smokers compared to those with the highest incomes, and men with less than 12 years of education are 1.7 times more likely to be current smokers than men with higher education. Also, women with less than 6 years of education had a 29-fold increased likelihood of being smokers compared to women with higher education.[13] Furthermore, those in the Northern region have a higher percentage of current smoking (23.2%), overweight (36.7%), obesity (4.8%), hypertension (16.7%), and waist to hip ratio (0.88) than those living in the Southern region (15.5%, 15.3%, 1.2%, 11.8%, 0.86, respectively).[14 15]

Risk Factors:

The leading risk factors for CVD are tobacco consumption, inappropriate nutrition, and reduced physical activity.[16] Cigarette smokers are two to four times more likely to develop coronary heart disease (CHD) and twice as likely to have a stroke than non-smokers.[17] In addition, non-smokers who are exposed to secondhand smoke increase their risk of heart disease

by 25-30%.[18] This is especially a problem in China, where over 300 million people smoke, consuming an estimated 1.7 trillion cigarettes per year.[19] 62% of Chinese men smoke actively, and at least 49% of non-smokers (predominately women) are exposed to second- and third-hand smoking at home or at work.[20] [21] China is also the world's largest tobacco producer.[22]

A higher salt intake is associated with a greater incidence of total cardiovascular events.[23] Chinese people intake greater than 12 g of salt per day per person, twice the maximum intake recommended by the World Health Organization.[24] In addition, there is a strong inverse association between fruit and vegetable intake and the risk of subsequent cardiovascular disease – those who consume fruits and vegetables more than three times per day compared to less than once a day had a 27% lower cardiovascular disease mortality.[25] While there was an increase in fruit consumption in Chinese households from 1993 to 2001, there has been a significant decrease in vegetable consumption during the same time period.[26]

Physical inactivity has been associated with a 1.5- to 2.4-fold increase in CHD risk.[27] China has experienced a decline in metabolic equivalents of task (MET), a measure of physical activity, from 399 MET hours per week in 1991 to 213 MET hours per week in 2009.[28] This trend will continue, as China's physical activity is projected to drop to 188 MET hours per week by 2030.[29] Time spent in sedentary behaviors is also projected to increase from 20 hours/week in 2009 to an estimated 25 hours/week in 2030.[30] Moreover, these three behavioral risk factors are the root causes of other conditions that contribute to the manifestation of CVD, such as overweight, central obesity, high blood pressure, dyslipidemia and diabetes. [31]

Physical and Socioeconomic Consequences:

CVD is associated with impaired neuropsychological function, household impoverishment, and economic losses in the form of loss of productivity. In addition to mortality

and physical disability, such as paralysis and speech difficulty after strokes, CVD also results in impaired neuropsychological function.[32] Studies have linked CVD to accelerated cognitive decline, structural and functional brain abnormalities, and vascular dementia.[33] Depression is also three times more likely to occur in patients after a heart attack than in the general population.[34]

The high costs of CVD treatment can drive families, especially those with low incomes in rural households, into poverty.[35] In China, general medical spending has raised the number of rural households living below the poverty line by 44.3%.[36] In 2003, the CVD burden in China lead to $26.1 billion in direct health costs, with only 23.9% of outpatient costs and 35.2% in-patient costs, on average, paid by medical insurance.[37] Thus, if CVD is not addressed and financial protection is not provided, the costs of treatment and care will likely drive even more Chinese households into poverty.

From 2005 to 2015, China is projected to annually lose US $53 billion of national income due to deaths from heart disease, stroke and diabetes.[38] [39] By 2015, China will lose an estimated 1.18% of GDP to NCD deaths, up from 0.31% of GDP in 2005.[40] In addition, more than 6 million years of potentially productive life are lost in China each year due to heart disease and stroke, and in 2030 the number of years of productive life lost will rise to almost 10.5 million.[41] While presently 30-40% of CVD deaths occur in Chinese people of working age, the loss of productivity will be exacerbated in 2030, where over half of the expected 9 million CVD deaths will occur in those aged 35-64.[42]

Priority Action Steps:

To immediately and efficiently address this issue, China must increase tobacco taxation, implement educational campaigns to reduce smoking, and reduce salt consumption. To start,

reducing CVD mortality will pay large dividends, as a 1% per year reduction produces an annual benefit of about US $2.34 trillion (PPP), while a 3 percent reduction would amount to an annual benefit US $5.40 trillion (PPP).[43] Towards this end, it has been found that tobacco taxation has the highest benefit-cost ratio (40:1) in order to reduce tobacco consumption.[44] At an annual cost of only $0.5 billion and with a low level of implementation capacity required, taxation will produce a benefit of 1 million deaths averted annually and can also raise substantial revenues in China.[45] In fact, aggressively reducing active smoking in Chinese men to 20% prevalence in 2020 and 10% prevalence in 2030 would prevent 2.9 to 5.7 million total deaths over 2 decades.[46] In addition, an estimated one out of three male teenagers smokes.[47] In order to prevent the next generation of young Chinese from tobacco- and CVD-related deaths, it is necessary to implement school education programs, such as Project HRIDAY from India, that target youths, have a significant impact on tobacco use, and are highly cost-effective.[48]

Salt reduction is another investment with a high benefit-cost ratio (20:1), as a $1 billion annual investment produces a benefit of 1.3 million deaths averted per year.[49] It has been found that a reduction in salt intake from 10g to 5g per day could reduce CVD by 17%.[50] China can learn from the UK "All Salted?" Program, which utilized consumer education, food reformulation, and food labeling to reduce salt consumption by 0.9 g per person per day.[51] In the long term, China should invest in media campaigns, agricultural policy changes with respect to vegetable availability, and better city planning to reduce the unhealthy diets and physical inactivity associated with CVD.[52]

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