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Public Health Issues – Promise and Peril

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INTRODUCTION

The common good of mankind is enshrined in our understanding that sustainability must embrace the context of public health. Beaglehole and Bonita describe public health at a crossroads in two directions – one addressing the sociocultural foundations of health, and another focusing on proximal factors[1]. The first one has broad perspective in public health that has been vigorously advocated by many public health professionals with convincing justifications. Public health professionals are frustrated when they witness egregious social ills such as poverty, discrimination and inequality, homelessness, violence and war, and there has been a growing sentiment when they cannot deal with such situations. In 2010, the US government's Healthy People outlined health goals for the next decade, focusing on the reduction of health disparities and reflecting a growing interest in distal causes[2]. Williams *et al*[3] argued that interventions within the healthcare system that address some of the social determinants of health and, in upstream factors such as housing, neighborhood conditions and increased socioeconomic status, have the potential to improve health for all, reduce disparities in health and create more productive and rewarding lives.

Although addressing upstream causes is essential in confronting public health issues, the focus on health disparities provides a powerful means for tragetting and eliminating social and economic injustices. Along with the promise of this approach, there is considerable peril that deserves attention. The study of social and economic factors in public health may have unintended consequences that, paradoxically, serve to preserve disparities rather than eliminate them[4]. This occurs because public health research transports social issues into the health domain, where researchers examine the issues through the narrow prism of health relevance instead of within their political, social, and economic contexts.

This issue of the *Archives of Medical and Biomedical Research* highlights the problem of road traffic accidents, suicide occurrences, the correlation of caesarean rates to maternal and infant mortality, antibiotic susceptibility, global problems associated with obesity and the emergence of surgery as a public health player.

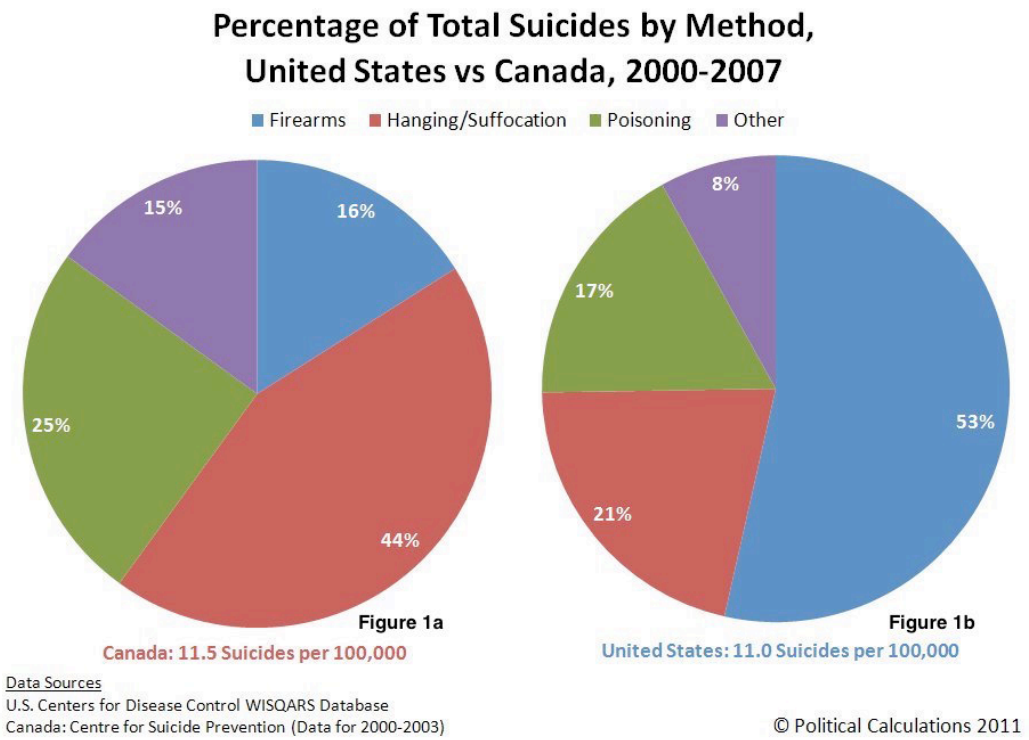
ROAD TRAFFIC ACCIDENTS

Allock *et al*[5], report their study on fatal road traffic accidents. Road traffic injuries are the leading cause of death worldwide. It is a real public health challenge for all the concerned agencies to reduce the number of road accidents. The authors analyzed the trend of fatal road accidents in Mauritius over a 6-year period (2006-2011) in order to understand and determine potential preventive measures. Road traffic accidents involving male drivers outnumbered those of female drivers. In the main, the factors responsible for road traffic accidents are preventable and the authors emphasized the need for the nation's department of transport and the law enforcement agency worldwide to develop coherent strategies towards prevention. These include measures such as riders' training that needs rigorous research for its effectiveness, speed cameras, pedestrian safety knowledge of school-age children and improvement in roadway design. It is important to recognize that the driver's sleep, drivers with alcohol use, roadway alignment with curves, speeding vehicles, passenger cars, road conditions, high speed limit roads, and adverse weather are significant factors related to the high risk of fatal road traffic accidents.

SUICIDE RATES AND PREVENTION

Suicide is a global phenomenon in all regions of the world and considered as the second leading cause of death among 15 – 29 year olds. The commentary paper by Agnihotri and Aruoma[6] discusses the context of suicide, reviewing its global trend, prevention strategies, level of intervention and the interface between clinical and public health levels. The interventional strategies for the prevention of suicide include use of reasonable care and treatment of mental and addictive disorders, restricted access to lethal means of suicide such as firearms, pesticides, etc., improvement of media portrayal of suicide, school-based programs, availability of hotlines and crisis centers, and training of primary health care personnel. It is interesting that for countries such as Canada and the United States similar rates of suicide occur each year, with Canada averaging 11.5 suicides per 100,000 people and the U.S. averaging marginally lower at 11.0 suicides per 100,000 people in the years from 2000 through 2007 (**Figure 1a** and **Figure 1b** respectively). There are shifts when the various methods by which people in the U.S. and Canada have committed suicide (for example, suicide by means of firearms, hanging/suffocation, poisoning and/or other means) are factored in Figure 1b. The various forms of suicide attempts would be worthy of research extended to determine how these forms compare at a global level and assess the impact of such outcomes on the global economy. Social, psychological, cultural and other factors can interact to lead a person to suicidal behavior, but the stigma attached to mental disorders and suicide means that many people feel unable to seek help. Despite the evidence that many deaths are preventable, suicide is too often a low priority for governments and policy-makers. Prioritizing suicide prevention on the global public health and public policy agendas and to raise awareness of suicide as a public health issue is necessary. So what about potentially vulnerable populations? Transgender people often lack a support system and are more likely to face employment related discrimination, experience varying degrees of difficulties and have a much higher suicide rate. According to the American Foundation for Suicide Prevention "*the prevalence of suicide attempts among respondents to the National Transgender Discrimination Survey (NTDS), conducted by the National Gay and Lesbian Task Force and National Center for Transgender Equality, is 41 percent, which*

vastly exceeds the 4.6 percent of the overall U.S. population who report a lifetime suicide attempt, and is also higher than the 10-20 percent of lesbian, gay and bisexual adults who report ever attempting suicide. Much remains to be learned about underlying factors and which groups within the diverse population of transgender and gender non-conforming people are most at risk" It was indicated that the most striking finding of the analysis was the exceptionally high prevalence of lifetime suicide attempts reported by NTDS respondents across all demographics and experiences. It has been indicated that mental health factors and experiences of harassment, discrimination, violence and rejection may interact to produce a marked vulnerability to suicidal behavior in transgender and gender non-conforming individuals. Agnihotri and Aruoma discuss the study on suicide in the US Army that examined the risk and protective factors of suicide. The study was the largest on mental health risk and resilience conducted among U.S. military personnel. The rationale for the study was driven by the notions that historically, the suicide death rates in the U.S. Army have been below the civilian rate, the suicide rate in the U.S. Army began climbing in the early 2000s, and by 2008, was found to exceed the demographically matched civilian rate (20.2 suicide deaths per 100,000 vs. 19.2). It is worthy of note that countries that are guided by the WHO Mental Health Action Plan 2013–2020 (1) can aim for a 10% reduction in the suicide rate. For the long-term, importantly, reducing risk will go only part of the way towards reducing suicide, simply because any protective factor instituted must build for the future – a future in which community organizations provide support and appropriate referrals to those in need of assistance, families and social circles enhance resilience and intervene effectively to help loved ones, and there is a social climate where help-seeking is no longer taboo and public dialogue is encouraged.



CAESAREAN SECTION BIRTHS

According to the World Health Organization, governments have expressed interest in the rise in the numbers of caesarean section births and the potential negative consequences for maternal and infant health. Caesarean sections can be elective or emergency with both classes categorized by different medical indications. This lifesaving procedure can be a cause of short- and long-term health problems for women and their babies due to various reasons like lack of facilities to conduct safe surgeries, inadequate expertise, and surgical complications. Despite growing interest in the rates of elective caesarean delivery and its relative benefits, caesarean section harms the neonate. The data suggest the association between caesarean section and increased neonatal respiratory morbidity and lacerations, possibly decreased central and peripheral nervous system injury and potentially increased risks of neonatal mortality. Agnihotri *et al*[7] present a commentary on caesarean rates and analyze the need to fulfill the target rates versus actual need required to reduce infant and maternal mortality and set the standard for caesarean section. The authors conclude that increasing cases of caesarean deliveries are responsible for the gross health inequity among the various income groups at national and global level. From a public health perspective, there is still a huge dilemma about the desirable rate of caesarean sections, we strongly recommend that the government and policy makers should emphasize caesarean sections only for medically indicated cases rather than acquiring a desirable rate. In 2014, the World Health organization proposed the *Robson classification system* as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities over time, and between facilities. While the authors concur that adopting the Robson classification system as a global standard for assessing, monitoring and comparing caesarean section rates within healthcare facilities over time, and between facilities remains imperative, low and middle-income countries should improve their accessibility to this medical help, which could decrease adverse maternal and neonatal outcomes, while on the other hand, high-income countries should reduce overuse to avoid and minimize added morbidity and financial burden at the national and global level.

ANTIBIOTIC RESISTANCE

Putting a public heath handle on antibiotic resistance requires a multifaceted approach to reduce the inappropriate use, prevent disease transmission, and develop new antibiotic agents. Mzungu *et al*[8] report their study on 0-5 year old children with diarrhea and the propensity of antibiotic susceptibility of Salmonella and concluded that for diarrheal diseases, Salmonella still remains one of the major and most important bacterial pathogen of diarrhea among children in the study area. Multiple antibiotic resistance was observed in 100% of the isolates pointing to the fact that level of significance antibiotic resistance has for public health especially in child health. Salmonellosis is a major cause of bacterial enteric illness in both humans and animals. Although it may be argued that the number of antimicrobial-resistant Salmonella serotypes has not increased drastically in recent years, drug-resistant Salmonella continues to pose a public health threat in the United States, particularly as resistance spreads across classes of drugs, necessitates the use of more expensive drugs, makes treatment less effective, and, in worst-case scenarios, leaves infections untreatable. Diarrheal disease is an important global problem that causes high rates of morbidity and mortality in developing countries. Among the bacteria causing diarrhea,

Salmonella continues to be at first place. Over the last two decades the incidence of non-typhoidal Salmonella infections has increased[9]. It is estimated that non-typhoidal Salmonella cause between two hundred million and 1.3 billion cases of intestinal disease including 3 million of death each year worldwide. Examining the antibiotic susceptibility patterns of pathogens is important toward tailoring treatment to the ever-changing resistance patterns and distribution of pathogenic bacteria. During the last decade, antibiotic resistance and multi-resistance of Salmonella spp. have increased a great deal, especially in developing countries with an increased and indiscriminate use of antibiotics in the treatment of humans and animals. The work of isolating, identifying, and reporting on Salmonella serotypes must go on for diagnostic, therapeutic, and public health purposes. There is a need to continue extensive multi-center studies involving both rural and urban areas to identify all the risk factors precipitating diarrhea, which will lead to policies on preventive programs globally. Indeed, other than contribution from infections, aspects such as socio-economic, and environmental factors coupled with health, physiological and behavioral risk factors have to be weighed when exploring effective control of diarrhea in the under-five segment of the population.

OBESITY AND GLOBAL HEALTH

Obesity and overweight have many causes, including genetic, metabolic, behavioral and environmental. The rapid increase in prevalence suggests that behavioral and environmental influences predominate, rather than biological changes. With increasing obesity prevalence comes increasing obesity-associated diseases with the associated pathophysiology falling into two categories namely metabolic (type 2 diabetes mellitus, hypertension, dyslipidemia and consequent heart disease) and mechanical (obstructive sleep apnea, osteoarthritis) (**Figure 2**). Both major groupings of disease can be improved by weight loss and proper management of weight and therefore it is necessary to understand modern management[10-12]. Obesity during childhood is associated with decreased insulin sensitivity and increased circulating insulin levels. These abnormalities often persist into young adulthood. Insulin resistance is an important factor in the development of type 2 diabetes. The period of growth and development during adolescence is associated with a normal increase in insulin resistance. Obesity and obstructive sleep apnea are closely related in adults and children. Obstructive sleep apnea may also contribute to ongoing weight gain and increasing severity of obesity. This may be due, in part, to the increase in daytime sleepiness. It may also be due to changes in appetite and eating patterns, particularly, eating late in the day and at night. Given the very wide metabolic variation that does occur between individuals, any approach obviously must be tailored to each individual's unique body metabolism. Most weight management approaches consider calories in and calories out since a chronic imbalance in this area leads to weight gain, but public health professionals treat individuals as though these differences do not exist. Indelicato[13] presents a summative opinion and indicates that public health professionals must seek to reduce this stigma and help reduce the consequences which follow any stigmatization, namely shame, prejudice, guilt and depression. A further assertion is that obesity is largely a function of metabolism and that, in large part, the true disease of obesity is the stigma that society places on those who are overweight. Sometimes the true epidemic may not be of obesity but of the attitudes toward those who are overweight. Cure

those attitudes, seek ways to better understand metabolism and what causes variances in it, and true progress will be made, but treat the stigma first[13].

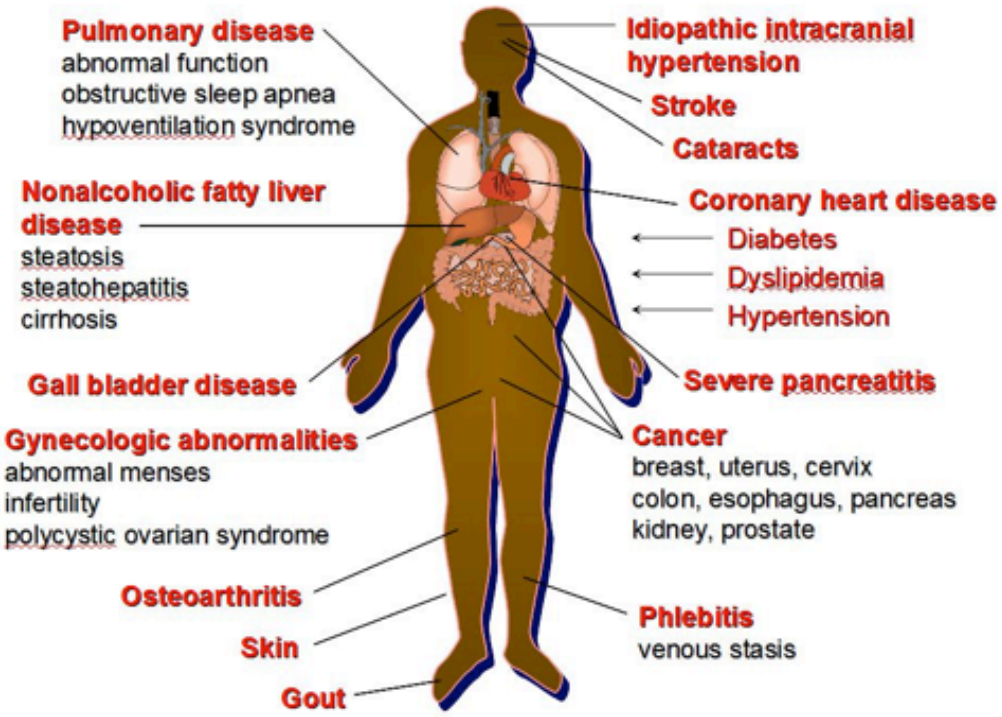


Figure 2: Pathophysiology and medical complications of obesity. Obese individuals are at increased risk for all cancers especially endometrial, gall bladder, uterine, ovarian, colorectal and prostate. Practical guidelines for managing obese patients is widely accessible in the literature and online, however, the paper by Malnic and Knobler[10] discusses data from many studies evaluating the impact of obesity on mortality and morbidity.

SURGERY AND PUBLIC HEALTH

Health conditions cannot be neatly split between those that require surgery and those that do not. Different diagnoses range widely in the proportion of patients requiring some type of surgical procedure. At the upper end are admissions for musculoskeletal conditions and at the lower end are admissions for mental health conditions. Dawka[14] discusses the emergence of surgery as a major force in the public health arena concluding that there is a pressing need for surgeons themselves to reposition surgery in the global health scenario by advocating and implementing principles that project the discipline as a powerful tool in the worldwide campaign for human health. Surgery has hitherto never been considered seriously in matters of public health given its reliance on highly trained personnel and expensive infrastructure. The surgical capabilities required are not only those related to performing operations but surgical care also involves preoperative assessment, including the decision to operate; provision of safe anesthesia; and postoperative care. Even when patients do not need surgical procedures, surgical providers often provide care, such as management of severe head injuries and resuscitation for airway compromise and shock in patients with trauma. Such care occurs in contexts in which clinicians must

be prepared to intervene operatively as complications arise or conditions deteriorate. While surgery does have its champions in the public health arena, it is the everyday practicing surgeon who can help change this by thinking and talking about it, and choosing to act. A new generation of surgeons conditioned to this viewpoint as spokespersons and movers, can set the stage for surgery to realize its full potential as a component and complement of all global health endeavors.

CONCLUSION

The public health context in this special issue is epitomized by the salient comment of Professor Dawka that "the general perception of global health programs has been as ideally community-based, with emphasis on communicable diseases, nutrition, hygiene and prevention. Surgery has unfairly been seen as elitist, adhocist, demand-based and beneficial to individuals, not populations". The excerpts of the outcome document of the United Nations Conference on Sustainable Development (Rio+20), "*The future we want*", reads "*We recognize that people are at the center of sustainable development and, in this regard, we strive for a world that is just, equitable and inclusive, and we commit to work together to promote sustained and inclusive economic growth, social development and environmental protection and thereby to benefit all*". As observed by Professor Aruoma, the United Nations 2015 Sustainable Development Goals has a facet on public health that embraces revitalizing awareness of global natural resources and utilization of global communities to ensure poverty alleviation through sustainable agricultural practice, disease control, enriched lifestyle and wellness. It is unequivocal that the world's unity can be the best derived through the realization of the UN's 2015 Sustainable Development Goals[15].

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