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STUDENT PERSPECTIVES *on* TODAY'S GLOBAL HEALTH ISSUES

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Letter From the Editors

Dear Reader,

The Prognosis is the first undergraduate student journal at McGill that aims to spark global health discussion among young people in Montreal. Global health is a fairly new term that can be interpreted in many ways. We, the students involved in this journal, would like to provoke debate on the topic of global health, by presenting articles, opinions, and research on diverse issues related to health in different parts of the world.

Our inspiration for this project began in September of last year, born out of our personal fascination with health issues and excitement over the emergence of global health as a hot topic on campus. Although previously involved with the Lancet Student online journal, we decided to branch out in order to create a more focused impact among our student body. McGill University provides a great deal of opportunity to learn about global health, through various academic courses, current research, internships, and programs abroad. We, the creators, publishers and promoters of this journal, have been inspired by such opportunities and want to encourage others to consider the intersection of social, biomedical, global, and local perspectives on health.

Thanks to all those who submitted articles and who helped make the journal a success,

The Prognosis Editorial Committee

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Inequalities in Pre-Natal Healthcare

Claire Peterson

Over 3.5 million infants die each year, almost exclusively in the developing world[2]. Many initiatives to increase children's health have been funded, especially in the wake of Millennium Development Goal #4, which calls for the mortality of children under 5 between 1990 and 2015 to be reduced by two-thirds. However, even the UN admits most countries are nowhere close to achieving this goal. Initiatives that have been funded to eradicate children's death have only funded the treatment of diseases that occur after the first month of life, like pneumonia and diarrhea, which account for 22% of children's mortality. So how will we ever reach Goal #4 when 41% of childrens deaths are being ignored[3]?

Finally, with only 5 years left to complete the Millennium Development Goals, 40 billion dollars has been pledged over the 5 remaining years to aid maternal and children's healthcare[1]. Low-cost solutions are not new knowledge – kangaroo care and nutrition for premature babies, immunizations to prevent diseases passed in utero, the importance of breast-feeding and programs to train health care workers have been around for decades. What's worse is that many countries that will receive funding have set their own goals in terms of maternal and children's healthcare, but I was hard-pressed to find more than a handful of countries that mention newborns in their plans.

Imagine that you are a 28-year-old Canadian woman who is 7 months pregnant and that you suddenly go into labor. In Canada neonates of 5.5 month gestation are viable candidates to live, so you need not worry. Your hospital room is equipped with all of the latest technologies and the neonatal intensive care unit is right down the hall. Anything and everything you need is right at your fingertips and your insurance will cover a large part of your medical expenses. You will be afforded the best healthcare in the world from the most educated health professionals. You are one of the lucky ones, only 1% of neonatal death occurs in developed countries[2].

Now let's pretend you live in Uganda, a country stricken with poverty and lacking adequate healthcare. More likely, you are not 28, but only a teenager, which makes your pregnancy more risky. You must walk over 10 kilometers to reach the hospital, which is understaffed and overburdened, so like many other women in rural communities you will choose to have a home birth. Since you have received no prenatal care you will likely have some sort of disease, like malaria, which can be fatal to a fetus. You also may not have access to proper nutrition, so your seemingly 7 month old fetus may actually only be as developed as a 6 month old fetus, leading to a baby born of low birth weight which is the cause of 70% of neonatal deaths. Only 1 in 5 women in developing countries have access to skilled nurses and midwives who are trained to perform essential newborn care[2]. Even more upsetting, your baby may be asphyxiated because its lungs are still too small to breathe on their own – easily remedied by an inexpensive bag and mask system, but even this simple intervention has not been implemented. In Uganda, newborn deaths each year cause an estimated 90,000 deaths which makes 1125 buses full of dead babies according to the Uganda Newborn Study[4]. This tragedy, like many others, is most prevalent in Sub-Saharan Africa and Southeast Asia where communities have the least access to information and interventions.

Even if you don't have a soft spot for babies, economically speaking, newborn complications are costly. Neonatal complications can result in severe disorders like cerebral palsy or chronic bronchitis, not only putting an economic cost on the family, but also on the community health system. When considering the numbers, neonatal complications affect over 1 million infants each year. Not only is a family less productive, but also villages and even cities are less productive. Finally, the social cost of neonatal complications or death is immense for a mother who may become depressed because she is outcast by her family or village[2]. Many women each year in developing nations bear children expecting that each child will help the family gain prosperity, but a complicated pregnancy puts families into debt. Neonatal survival is proven to decrease future birth rates[2].

So why have we waited to invest until now? Most people believe that expensive high tech hospital equipment is required to save infants, but a mere $5 per capita spent on neonatal care each year could avert 2.6 million deaths according to Dr. Viviana Mangiaterra, an expert in international public health. Further, even at the height of the internet, available data relating to neonates is scarce; too scarce to receive policy attention[2].

More than 150 countries have pledged their support to the Millennium Development Goals[3] and now that funding has been secured its time countries fulfill their promises. The knowledge to reduce neonatal deaths by over 50% is at our fingertips[2] and we should be using it. In order to reach Millennium Development Goal #4 it is imperative that interventions to save infant lives are implemented.

Claire is studying Anatomy and Cell Biology and International Development Studies, working towards her Bachelor of Science. Her research interests include maternal and children's health care with a particular focus on providing inexpensive and effective neonatal survival tools.

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Homelessness and Tuberculosis Transmission in Urban America

Katie O'Sullivan

Abstract

Among industrialized countries, the U.S has arguably struggled most with alleviating homelessness, ever since the issue breached the federal policy agenda in the 1970s. Homelessness is associated with a diverse range of risk factors that increase an individuals vulnerability to infectious disease: poor living conditions, compromised mental and physical health, and risky behavior such as intravenous drug use. Within the U.S, the re-emergence of tuberculosis in the 1990s disproportionately affected the homeless in urban areas. This paper critically reviews the effects of homelessness on tuberculosis transmission in cities across the United States. I approach the peer-reviewed literature with three objectives: to determine first what risk factors and transmission mechanisms characterize TB cases among the urban homeless, second, what methods have been used to monitor transmission, and third, what treatment techniques have proven most effective for managing transmission. The literature effectively addresses these objectives through descriptive case studies in cities throughout the U.S, though does not satisfactorily contextualize observed trends within broader-level social, political, and economic forces, which are together changing what it means to be homeless in urban America. Specifically, efforts to monitor and treat the new tuberculosis should account for the new homelessin light of differential effects of treatment noncompliance, multi-drug resistant strains, concurrent infection with HIV/AIDS, and behavior on the health risk of these populations.

Introduction

Among curable communicable diseases, pulmonary tuberculosis (TB) is the leadingcause of death worldwide [7]. About one third of the global population is infected with the bacteria Mycrobacterium tuberculosis, which may lie latent in a human hosts lungs for many years before progressing into an active infection [7]. Symptoms include coughing, chest pains, weakness, weight loss, and fever, and if left untreated, the disease may be lead to death. A hosts weakened immune system may trigger the transition from latent to active TB. Once afflicted with active TB, the host becomes infectious and may transmit bacteria to others via droplets from the throat and lungs expelled into the air [35]. Tuberculosis is an ancient disease, largely reflective of poverty, whose prevalence is distally patterned by a multitude of social, political and economic forces [28, 29]. In industrialized countries, reports of TB cases have declined since the nineteenth century [28]. However, this trend reversed in the 1980s when widespread HIV infection caused the disease to reemerge [28]. Increased migration of populations from countries with high TB prevalence, development of multiple drug resistant strains of the bacteria, and deterioration of health care infrastructure supporting TB control, have all contributed to global re-emergence of the disease [28]. In fact, the World Health Organization (WHO) declared tuberculosis a global emergency in 1983 [34]. It is argued that the historical decline of tuberculosis is better understood than this re-emergence [11]. Today, tuberculosis persists in industrialized countries as an important public health problem, with the majority of cases occurring in poor and minority groups, such as displaced, migrant, and cross-border populations, injection drug users, sex workers, and the homeless [9]. Homelessness is a socioeconomic phenomena associated with disadvantaged populations and ill health throughout the life course, and is growing in industrialized nations [19]. Homelessness is a public health problem that is increasing in severity, and homeless populations are more susceptible to emerging and re-emerging infectious diseases such as TB because of poor living conditions and limited access to healthcare systems [2]. Homelessness and associated social exclusion may worsen health status, while those whose health is already compromised by mental or physical illnesses are more susceptible to homelessness or poor-quality housing, due to unemployment and poverty [32]. Among the homeless, TB rates may be twenty-times higher than general populations in the U.S across rural and urban areas[4]. In urban populations, persisting high incidence rates are largely due to ongoing transmission in homeless shelters [13].

In light of this trend of new or reemerging tuberculosis among marginalized groups like the homeless, Paul Farmer (1997) calls for research in the social sciences to discern the mechanisms by which social forces affect TB transmission, and also to identify barriers that prevent those with multiple-drug-resistant TB from accessing proper care. To contribute to Farmers call-to-action, I aim to evaluate how the social process of urban homelessness has affected the re-emergence of tuberculosis in the U.S from the 1980s onwards. In order to do this, I approach the peer-reviewed literature with three sub-objectives: to determine first what risk factors and transmission mechanisms characterize TB cases among the urban homeless, second, what methods have been used to monitor transmission, and third, which treatment techniques have proven most effective for managing transmission. To address these objectives, I analyze research conducted in cities throughout the U.S, with a special focus on the New York City case study, where the 1990s TB outbreak was most prominent.

Analysis

I. Risk Factors and Mechanisms of TB Transmission Among the Homeless

Homelessness in the U.S stands out as an endemic social problem, with prevalence rates between 200-500% greater than those in Western European countries [31]. Among all developed nations, the highest concentration of homeless people occur in the traditionally poorest areas of large urban settings [16]. Though structural forces such as housing policy are crucial in shaping these settings, the literature relevant to my aim largely focuses on the lived experience of poverty in evaluating risk. A study regressing structural risk factors with homeless rates in 52 U.S metropolitan areas demonstrated that poverty rates strongly affect homelessness, more so than factors such as lack of affordable housing, unemployment rates, and impact of government benefits [12]. This finding adds a new dimension to preceding literature that describes homelessness as a macro-economic and housing problem [12]. In regards to poverty, characterizing the homeless became more flexible with the emergence of new homelessness in the 1980s, as homeless status was conferred from middle-aged, single men with chronic drug or alcohol addictions, onto new and different groups not previously identified as homeless [30, 22, 16]. These groups are vulnerable to poverty and include families, women, youth, the elderly, and marginalized ethnic or migrant groups experiencing episodic bouts of absolute homelessness, insecure housing, or inadequate housing (ibid).

In urban settings, crowded emergency shelters have been identified as the primary origins for the U.S tuberculosis epidemic in the 1990s [31]. However, outside of homeless shelters it is unclear what characteristics of the urban environment may foster TB outbreaks. To address broader determinants of TB transmission in urban environments, a systematic review examined population-based studies that attempted to quantitatively identify risk factors for geographic clustering of tuberculosis cases [10]. Prevalence of homelessness was not a statistically significant risk factor for clustering, though percent locally born, percent pulmonary TB, percent HIV-seropositive, and percent alcohol abuse had positive influences, while mean age had a negative influence on clustering [10]. Though homelessness was not a significant predictor of clustering, a high proportion of locally born people in an area probably indicates a lack of mobility due to poverty or poor health, which may covary with other variables investigated, such as alcohol abuse, HIV seropositivity, and homelessness.

The New York City Case Study

There is a large body of literature discussing the tuberculosis transmission among homeless populations in New York City (NYC) in the 1990s, when citywide TB incidence rates peaked upwards of 3,000. However, by 2006 TB case rates in the city were still three times higher than the national average [17]. Due to the quantity and methodological quality of research in response to this issue, NYC provides an informative case study for analyzing homelessness and TB transmission over time. The re-emergence of tuberculosis there and throughout the world has largely been attributed to the AIDS epidemic. However, rises in homelessness predating AIDS have also contributed to the resurgence [5], though this is unexplored in the literature. Evidence from a cross-sectional survey of high-risk homeless men residing in a NYC shelter revealed that total time homeless correlated positively with active and latent tuberculosis infection, and most cases of active tuberculosis were among individuals with AIDS or AIDS-related complexes [33]. This finding has important policy implications – if someone is more likely to acquire TB the longer they have been homeless, then interventions may target treatment towards the chronically homeless, and surveillance/preventative measures towards the newly homeless, as well as those with HIV/AIDS.

Noncompliance with TB treatment among the homeless is associated with behavioral factors and pre-existing health conditions such as HIV/AIDS, and may lead to multiple drug resistance. A retrospective study resembling a case-control design demonstrates this by examining TB cases in an urban community hospital in New York City, and comparing frequency of drug resistant strains between homeless and non-homeless populations [27]. Drug resistance was found to be significantly higher among homeless populations, and particularly among those with HIV/AIDS. Drug resistance was also significantly higher among black populations (ibid). The link between HIV/AIDS and TB in the urban homeless is also evident in a prospective cohort study of 224 TB patients admitted to a hospital in New York City in 1988 [5]. Of total patients discharged on TB treatment, 89% were lost to follow-up and failed to complete therapy, and 27% of discharged patients were readmitted within 12 months with confirmed active TB. Noncompliance with treatment was significantly associated with having AIDS or an AIDS- related complex, homelessness, and alcoholism (ibid). Because HIV infection and tuberculosis affect subpopulations with high rates of substance abuse and homelessness, treatment noncompliance is a particular issue.

These trends hold true in other U.S cities, even on the opposite coast. Analysis of TB surveillance data on high-risk populations in San Francisco from 1993 through 2005 reveals that the timing of contacts with HIV positive individuals and emergence of new TB cases is temporally consistent as a matter of cause-preceding-effect. This supports the theory that HIV is a key factor in sustaining TB transmission among the homeless in San Francisco [23]. Self-reported health and behavioral characteristics of patients is another (albeit limited) means of evaluating risk factors for TB infection. A study assessed perceived health status of homeless adults with latent TB undergoing a treatment program in Los Angeles [25]. Women were more likely than men to self-report worse overall and mental health status, as well as using drugs daily. Homeless adults reporting worse health were more likely to have used injection drugs, to report depressive symptoms and poor mental health, and also to be homeless for more than three years. This supports the previously discussed finding of Torres et al. (1990) that the chronically homeless are more likely to experience poor health, TB, and/or HIV infection, which may be compounded by behavioral risk factors.

II. Methods for Monitoring Tuberculosis Transmission Among the Urban Homeless

Contact investigations are monitoring methods that aim to establish transmission pathways from person-to-person, and involve having TB patients list close contacts [18]. However, this technique can be difficult in homeless populations because it requires patients to divulge personal and sensitive information. Improving interview skills of contact investigation workers may help establish trust and make homeless TB patients more willing to provide information, thereby increasing the number of contacts identified among homeless populations (ibid).

In contrast to contact investigations, analyzing the genetic information of TB infection within populations may reveal transmission networks and sites that might not otherwise be discovered. In a recent study, Myobacterium genotype clusters associated with outbreaks among homeless adults in New York City allowed researchers to identify and differentiate risk factors linked with particular strains of the bacteria [17]. TB cases in clusters of strains that have circulated in a community over an extended period require additional investigation as to whether clustering resulted from recent TB transmission, or reactivation of remote infection (ibid). Another study in Denver, Colorado used DNA fingerprinting of Myobacterium tuberculosis from positive cases identified by homeless shelter screening, to identify cases resulting from recent transmission. Cases with identical DNA fingerprints clustered within two years served as an indicator for recent transmission, and researchers saw that the frequency of these clusters decreased over four years, in which the screening program was implemented, indicating that early screening at the shelter was effective in limiting TB transmission [13]. This monitoring method is thus capable of assessing treatment effectiveness in addition to descriptive transmission patterns. In another study, DNA fingerprinting was combined with medical histories and interviews to identify epidemiological connections and clusters between TB cases around the Washington D.C area [15]. Through these methods, over half of the cases were connected directly to a large urban homeless shelter, or were connected by time and place pending histories of homelessness, social networks, and shared boarding or transitional housing (ibid). This suggests that mixed monitoring methods involving personal interviews and contact investigations, in addition to genetic analysis, may prove most effective.

III. Methods for Treating Tuberculosis Cases Among the Urban Homeless

The task of treating TB in homeless populations provides a compelling opportunity for collaboration between diverse public and private agencies at the municipal level. The Centers for Disease Control and Prevention (CDC) has clearly outlined priorities for TB prevention and control programs to evaluate transmission pathways through contact investigation, and to treat TB patients with latent or active infections [30]. However, the capacity for these plans to address the needs of homeless populations has varied in practice, as demonstrated by the following examples.

An urban homeless shelter in Charleston, South Carolina successfully implemented a prevention and control plan addressing priorities highlighted by the CDC, involving collaboration between different municipal institutions [20]. The program involved screening new guests to the shelter for TB within a week of arrival and every six months from thereon, while a public health nurse provided preventative therapy at the shelter twice a week. This program had a 77% therapy completion rate for TB patients (a dramatic success in comparison to the 11% completion rate found by the aforementioned Brudney and Dobkin study in NYC), and the authors attribute this success to the collaboration between the shelter, a nursing clinic, and the local health department.

In Baltimore, Maryland a resource-intensive alternative to existing City Health Department TB treatment programs for the homeless increased treatment completion rates from 11% to 33% [14]. The improvement seems modest, but is in fact three-fold. The program involved collaboration between a faith-based organization, an academic institution, and local government. The collaborative effort provided intensive tracking and coaching interventions for homeless TB patients over a nine-month period. Given the modest improvements in treatment completion relative to conventional programs, however, the feasibility of implementing such a resource-intensive treatment collaborative program may be limited in other settings (ibid). Importantly, the authors acknowledge that nurses are integral in developing supportive relationships with homeless patients, and in providing primary care. The importance of nurses also comes through in a cross-sectional study in Los Angeles, California [26]. The study assessed predictors of therapy completion among homeless TB patients who received either a nurse case-managed program or a usual program without a nurse. Treatment completion was significantly and positively associated with participation in nurse case-managed program, older age, and less illicit drug use (ibid). The nurse case-managed program also predicted satisfaction with treatment and greater TB knowledge, indicating that this approach to treatment may prove a viable option among groups such as the homeless, who are transient and difficult-to-treat by conventional methods (ibid).

Other methods to monitor and control tuberculosis transmission include rapid genotyping systems [6] and computer simulation models [4]. A simulation model revealed that improving access to treatment among homeless populations with active and latent TB was more effective in reducing TB cases and deaths over ten years, in comparison to improvements in the effectiveness of the treatment programs (ibid). This suggests that intervention studies similar to those just discussed should also address the extent to which homeless populations would be able to access programs under investigation, rather than program effectiveness in isolation.

Discussion

The ways in which urban homelessness affects and is affected by re-emergence of tuberculosis are largely influenced by national and international social, political, and economic forces, including urban housing markets, social networks, employment trends, and government spending on social welfare programs [22, 16]. These forces manifest themselves in terms of the risk factors and transmission mechanisms that pattern my preceding discussion of TB incidence, monitoring methods, and treatment methods. While homeless shelters provide a social safety net for those without secure housing, my analysis demonstrates that over the past twenty years they have proven extremely important in proliferating and sustaining active tuberculosis infection and transmission among homeless populations. Monitoring and treating these groups is extremely difficult due to their transient nature and social marginalization – that is, TB patients that are homeless are more likely to not comply with treatment or surveillance efforts.

In reference to broader structural forces, framing discourse of new or re-emerging tuberculosis in terms of new homelessness could respond to McMichaels (2004) contemporary human-microbe transition, brought on by widespread demographic, environmental, and technological change in human ecology, and compounded by the improper use of antibiotics. While determinants of TB emergence have recurred throughout history, social and environmental changes of unprecedented complexity and intensity have created more opportunities for emergence and re-emergence than ever before [3, 24]. However, my analysis has demonstrated that the literature does not adequately address the dynamic nature of homelessness and its effects on tuberculosis transmission within urban U.S populations. That is, the literature neglects the new homeless, characterized by more episodic rather than chronic states of homelessness, families, women, youth, and minority populations experiencing a wide range of insecure or inadequate housing circumstances [16]. These homeless populations do not fit into the models of homelessness discussed in the literature on urban TB transmission in the U.S over the past twenty years. The new homeless tend to rely on social networks and transitional housing rather than homeless shelters for housing assistance (ibid), and may be characterized by a different set of risk factors for

TB acquisition than factors such as drug use, HIV/AIDS infection, and treatment noncompliance, which dominate this papers analysis of transmission. Differing transmission pathways will, in turn, affect what TB monitoring and treatment methods are best suited to these populations.

Conclusion

My analysis demonstrates that tuberculosis transmission among the urban homeless in the U.S is characterized by pre-existing HIV/AIDS complexes, alcohol abuse, intravenous drug use, poverty, and treatment noncompliance, and the resulting development of drug resistant strains. Diverse methodological developments to monitor and treat TB cases have achieved varying levels of success, while mixed methods for monitoring transmission and collaborative, nursing-based treatment programs have shown the strongest results. However, the literature overall lacks discussion of how the changing nature of urban homelessness, specifically the emergence of the new homeless within the past three decades, has affected TB transmission in the U.S. This discussion would have important implications for evaluating which methods are most appropriate to monitor and treat particular cases. The case studies explored in this paper of localized TB outbreaks within urban American homeless populations create an enriching and descriptive mosaic of how TB transmission varies with particular risk factors. However, there is a need for more dynamic research to address how these patterns are changing in the context of broader structural trends in the U.S, such as housing and social welfare policies, as well as economic and social change.

Katie is finishing her B.A Honours degree in Geography, and looks forward to co-founding a small organic vegetable farm this summer in New Mexico! Besides agriculture, she is interested in the impacts of urban policy on health and environmental equity worldwide.

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A Crash Course on the Taiwanese Health Care System

Jason Tan de Bibiana

The Taiwanese health care system has famously been described as a car manufactured domestically from parts imported from abroad [3]. For many years, Taiwan studied the health care systems of other countries and consulted with health policy experts from around the world, before orchestrating a dramatic transformation of its own health care system. In 1995, Taiwan introduced its National Health Insurance program (known as the NHI), which extended health insurance coverage to all Taiwanese citizens and legal residents. Taiwan designed and implemented a government-run, single-payer system with universal insurance coverage much like what we have here in Canada. However, the Taiwanese system also boasts comprehensive coverage for prescription drugs, dental care, and traditional Chinese medicine, a cohesive electronic health-records system, and relatively short waiting times for health care.

Given that Taiwan has learned so much from the experience of other countries, I thought it was very appropriate that we Canadians a group of 10 students from McGill University representing a variety of degrees, experiences, and career aspirations also had the opportunity to learn from the Taiwanese experience. As part of an educational and cultural exchange organized by McGill‘s Comparative Healthcare Systems Program, we were invited to learn about Taiwan‘s ongoing experience with health care reform and policy development.

Before we left for Taiwan last May, I was doing my best to keep up with the health care issues close to home. My “Economics for Health Services Research and Policy” class discussed the latest health care controversies making Canadian news headlines when Newfoundland and Labrador Premier Danny Williams flew down to Florida for his cardiac surgery [1] and Québecs government was trying to sneak in extra fees for health care into its updated provincial budget [6]. The US health reform debate raged on and finally, US President Barack Obama signed the Patient Protection and Affordable Care Act into law on March 23, 2010 [7]. A friend of mine making a documentary on the US health care reform debate was just able to update her final cut to include this historic event.

With all this in mind, I was very keen to get a sense of the current health care issues in Taiwan. I was eager to observe what was similar and what was different between Canada and Taiwan‘s health care systems and excited to learn about the day- to-day realities of patients, doctors, public health professionals, policy makers, and other actors within the health care system. During our stay in Taiwan, we attended two formal lectures given by professors from the top universities on the topic of the national health care system and insurance program. However, I also learned a great deal about health care in Taiwan by talking to doctors, nurses, medical students, and everyone else I met.

Taiwans health care system is impressive in many respects. It has been successful in extending health insurance coverage to 99 percent of the population [8]. Before the establishment of the NHI, 41 percent of the population was uninsured the majority of whom were children and elderly persons but now there is universal coverage for all citizens and legal residents [3]. Health insurance in Taiwan under the NHI plan is comprehensive: medical care, preventive care, traditional Chinese medicine, home nurse visits, prescription drugs, and dental care are all covered [5]. Remember that in Canada, prescription drugs, dental care, and many other services are not covered by most provincial health insurance plans. We pay for these services from our own pocket, unless we have a supplementary health insurance plan.

In Taiwan, patients have the freedom to choose between many different health care providers and facilities. Traditional Chinese doctors often offer complementary treatments to biomedicine. Fortunately, every patient has a “Smart Card” that keeps track of their medical history in an electronic record. The “Smart Card” allows each doctor to see what services have already been provided or what drugs have already been prescribed, and it also communicates with the NHI to automatically process insurance claims and pay out the doctors. As a result, administration costs are very low for the Taiwanese health care system, at approximately 2 percent of its total budget [5]. Overall, Taiwan spends roughly 6 percent of its GDP on health care, compared to 16 percent in the United States [8]. And most importantly, the population is healthy and happy with the system. Life expectancy at birth is 75.3 years for males and 81.2 years for females [2], and public approval ratings of the NHI ranged from 60-80 percent from 2001-08 [3].

Some aspects of the Taiwanese health care system were very different from what I was familiar with in Canada. In Canada, we sometimes navigate a system of gatekeepers and referrals through the health care maze. To get an appointment with a specialist, we have to get a referral from our family doctor. In Taiwan, it is possible to bypass the gatekeepers and referrals to get an appointment directly with a specialist. Furthermore, because there are many health care providers to choose from and no gatekeepers, it is possible to see a doctor almost right away. The long wait-times that we have come to expect for health care in Canada are not a factor in Taiwan.

Instead of dealing with long wait-times like we do in Canada, patients in Taiwan do have to pay a small fee for each health care service they receive (known as a co-payment) to the health care provider. The co-payment is very small and the NHI sets a ceiling so that patients will not go bankrupt from the fees and waives the fees altogether for certain patients. In theory, the co-payments encourage patients to use less health care services, or at least make patients think twice about whether they really need to see the doctor. According to the RAND health insurance study, an experiment that randomly assigned families to different health insurance plans, the more people have to pay for health care services up front, the less they will use [4]. In Canada, although we can just show our health insurance card and receive medical care without any co- payments, our long wait-times and gatekeeper system may also ration the amount of health services we consume.

As it turns out, Taiwanese people use a lot of health care services: an average of 14.4 outpatient visits per capita per year vs. 6.4 per capita per year in Canada and 129 hospital admissions per 1,000 per year vs. 99 per 1,000 per year in Canada [3]. Small co-payments do not deter most Taiwanese people from seeking health care services when they have a health concern, and since there is no referral or gatekeeper system, people are able to see different doctors as they please. This leads to “doctor shopping,” a term that describes when a person consults with many different doctors for the same problem. Taiwanese people may also end up visiting a specialist unnecessarily and may even go to the hospital for a common cold.

Consequently, health care revenues have not kept pace with expenditures and the NHI has been running a deficit since 1998 [3]. The NHI is financed by premiums paid by the insured individual, their employer, and the government, as well as revenues from the lottery and a tobacco tax. Most people who are employed pay 30 percent of the premium, their employer pays 60 percent, and the government subsidizes the remaining 10 percent. The premiumshares vary such that self-employed individuals pay 100 percent of the premium and low-income individuals are fully subsidized by the government. In turn, the NHI is responsible for reimbursing health care providers for the services they perform and the patients also contribute the small co-payments to the health care providers. Since it has been politically unpopular to raise the premiums and Taiwanese people continue to use a lot of health care services, the NHI continues to pay out more to the health care providers than it takes in from premiums and taxes.

To try and control costs, the NHI has experimented with different ways of reimbursing health care providers. Originally, health care providers were reimbursed for each service they provided on a fee-for-service schedule without any limit, which allowed doctors to inflate their salaries by prescribing more drugs, seeing more patients, and performing more tests and procedures as fast as they could. To curb this problem, the NHI implemented global

budgets between 1998 and 2002 for dental care, traditional Chinese medicine, primary care, and hospitals. Each sector now has a set expenditure cap and is reimbursed at lower rates for any services provided beyond the cap, encouraging providers to stay within their set budget and stop abusing the fee-for-service scheme [3]. Most recently, the NHI has introduced a diagnosis-related-group reimbursement scheme, under which doctors are reimbursed a certain amount for different types of patients according to their primary diagnosis. These strategies hope to motivate health care providers to help control costs, and also provide better quality care. On the patient side, surveillance of the "Smart Card" records has been used to flag the highest users of health care services who may be guilty of "doctor shopping." Another recent development is the growth of the medical tourism industry in Taiwan, which may bring in significant revenue from China, the United States, and other parts of the world.

In our short visit to Taiwan, we were quick to notice aspects of the Taiwanese health care system that were different from, similar to, or better than our own system in Canada. Taiwan was very thoughtful leading up to its 1995 health system reform and has benefited from laying the foundations of a well-designed health care system. However, like other universal national health insurance programs, the NHI is challenged to run a sustainable program that also keeps doctors, patients, and the rest of the population happy. This unenviable responsibility requires ongoing troubleshooting.

The obvious conclusion that I came to after our crash course in Taiwan is that no health care system is perfect.

No two health care systems are the same either, but there is much to be learned from comparative study. Both the Taiwanese and the Canadian health care systems will face similar challenges in the future and hopefully, we can continue to learn from each other‘s experiences.

Jason Tan de Bibiana is interested in public health research and practice that addresses the social determinants of health, improves health care systems, and reduces inequity. He thinks that there is a lot of work to be done locally and globally. Jason graduated from McGill University with a Bachelor of Science in physiology, geography, and social studies of medicine and is currently based in Vancouver at the University of British Columbia‘s School of Population and Public Health, where he is pursuing a Master of Science in epidemiology, public health, and health services research.

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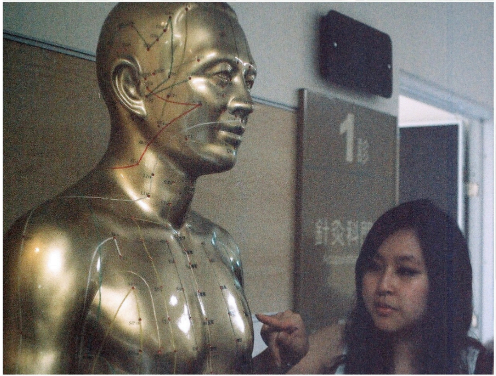
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A Sobering Reality: Understanding Russia's Alcohol Morbidity and Mortality from an Epidemiological and Political Approach

Peter Shyba

Previously published in the McGill Daily under the title "Historical Hard Drinking."

If Vodka cost a dollar fifty a dollar fifty for half a litre, how much of it would you drink? In Russia, where the price of Vodka averages between $1.50 and $3.00, the answer is simple: a lot [2]. Each year an average of 19,000 Russians die from alcohol poisoning and hundreds of thousands of others suffer the ill consequences of excess alcohol consumption – cirrhosis of the liver, heart disease, increased risk of cancer, type-twodiabetes, impaired mental development, and road accidents [1].

Between 2.5 and 20 million Russians are estimated to be alcoholics, contributing to the ten year gap in the life expectancy between genders (with men dying earlier than women), the highest of such gaps in the world [1][3]. The endemic effects of alcoholism are seen not just in Russia, but also among the whole block of former Soviet countries. While the rest of the developed world has progressed in terms of life expectancy, former Soviet Union countries have largely lagged behind.

New measures implemented by Russian president Dmitry Medvedev last winter that set a minimum price of vodka at $3.00 per pint (around half a litre) are meant to offset the detrimental effects that alcohol has, not only on the international image of Russia but also on its economic stability [4]. According to a Time Magazine poll, an estimated $8 billion from the Russian economy is lost per year due to drinking. This is due in part to the roughly 25 per cent of Russians who admit to drinking before work, while another 20 per cent drink during work itself [5]. While its too early to tell now if the measures have been effective, one can presume that the laws, meant to deter the poorest of Russians from imbibing too frequently will in fact backfire. Russians will continue to drink, and those who can't afford the $3 minimum may turn to illegal vodkas.

Bloomberg Business estimated that the black market accounts for 1.2 billion litres of alcohol consumption in Russia, half of the countries yearly average [6]. This bootlegged vodka accounts for about 127.6 billion rubles (around US $400 million) annually [6]. This black market Vodka comes in two different forms. The first is alcohol that is made in factories "off book", whereby factory workers manufacture extra vodka to sell for profits above their usually low wages. The second and more dangerous form is vodka that isn't actually vodka at all, but rather chemicals like household cleaning product or medicines mixed with water. In 2004 the Yekaterinburg district of Russia suffered three deaths and dozens of hospitalizations when residents drank disinfectants passed off as alcohol [11].

Perhaps the most interesting facet of this problem is the seeming paradox it presents to the liberal-minded international development community. Hobbess statement of life being "nasty and brutish and short," is true for many Russian men, whose life expectancy for is roughly sixty years old [3]. This statement has become an indelible call to arms for demographers and social scientists as a community, who constantly challenge this statement and implement policies with the primary intention of increasing life expectancy and disproving the verisimilitude of Hobbes's famous claim. Logic follows that since liberal democracies have seen a dramatic increase in life expectancy and quality of life, then development strategies that encourage liberalization (economically, politically and socially) will, in turn, increase life expectancy, health, and wealth.

Why then, was life expectancy at one of its highest points in Russia in the 1960s [3], arguably at the peak of the USSR? Why then is the gap in male and female health outcomes continuing to widen even though Russia is becoming relatively more liberal? The answer may lie in the bottom of the vodka bottle.

There are few things more stereotypically Russian than vodka, and the drink holds a fervent national significance. In 1977, Poland filed a claim to an international trade court that its nation was in fact the inventor of vodka and as such, was the only country with the right to market the drink [7]. If the claim had been accepted, Russia would have been forced to market their vodka as "bread wine," an idea that didnt sit well with the USSR. This claim ignited a fierce battle between the two countries, with Russian"scholars" claiming the drink was first brewed in Moscow in 1440. In an era of intense domination by the Soviet superpowers, Poland was unable to present the facts fairly; according to research done by Vice Magazine, it was in fact it was very likely Poland that first brewed vodka, technically giving them the exclusive right to market the drink[7]. The outcome of this battle would prove to be economically significant to the Russians. Vodka is now the one of the worlds most popular spirits, with annual sales in the billions of dollars. Sales of top-shelf brands like Grey Goose have risen particularly quickly, (the French-made Grey Goose was sold for $2.3 billion in 2002, the largest brand takeover in world history [8]).

In the Soviet Union, alcoholism was touted as a "relic of capitalism,"[9] where it was presumed that men were led to drink because of the exploitive nature of factory work. The belief was that through communism, alcoholism would eventually fade away. But the Soviets didnt do their homework. Alcoholism has been an issue in Russia since about 986 AD, when Muslim Bulgars encouraged Grand Prince Vladimir I to adopt Islam in that year. He declared: "Drinking is the joy of the Rus. We cannot exist without that pleasure.[9]"

Thousands of years (and many hangovers) later, Nicholas II, the last Tsar of Russia, ordered a countrywide prohibition during the First World War [8]. Already on the brink of revolt, the Tsar's decision further loosened his tenuous grip on power. In 1985, Gorbachev did the same as a part of Glasnost and Perestroika. Between 1955 and 1984, alcohol consumption had increased 250% in Russia [10], and Gorbachev decided to do something about it. He ordered limited hours on liquor stores and decreased the amount of alcohol restaurants could serve to patrons. Many began to drink cologne and rubbing alcohol with devastating health consequences [11]. Six years after that prohibition, the USSR was no more. Alcohol consumption seems to be a frequent and important aspect of Russian history and culture.

This history of alcoholism may give us some answer to the question of Russias poor life expectancy. Those dwelling in the former Soviet Union have historically been prone to alcoholism, in part, because there have been few occasions in history when these countries have been ethnically and nationally determined. It would seem that without autonomous leadership, these countries fall victim to a sense of pervasive helplessness, which in turn leads to a dependence on alcohol to escape. Their alcoholism is a somatization of their political repression. Similar to the condition known as Nervos[12], described by medical anthropologist Nancy Scheper-Hughes, Russian alcoholism is likely more political than biological or cultural in its epidemiology. In viewing the issue of alcoholism as a political issue rather than a biological one, it becomes less pervasive.

Even now, under what is called "democracy," Ukrainians, Russians, Belarusians, and other former Soviet bloc dwellers live under intensely paternalistic governments. Russian people specifically rely on their government to set rules regarding consumption. There are few rehabilitation centres, support groups, or government policies to help with prevention. The Russian government, now officially a "democracy," refuses to let go of Soviet style-paternalism when it comes to the health outcomes of its people. By extension, the stranglehold that Russia still has on its former satellites prevents them from truly liberalizing healthcare.

Ukrainians are now just starting to get their footing as a free country. The Orange Revolution signaling Ukraine's desire to end Russian dependence and join the European Union may be the exact freedom the Ukrainian people desire. Maybe then, once wealth can be created and the Russians lose their dominance over the region, the former Soviets have a reason to stay alive, and sober.

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Your Right to Know

Alexandra Markus

When I started volunteering at St. Mary's Hospital two years ago, I was placed in the outpatient department. Most of my job involved sorting and stamping charts, and delivering them to different departments of the hospital. In training, the secretaries couldn't emphasize enough that I must never let a patient see their own chart. Failure to comply with this strict regulation would result in immediate expulsion from the volunteer program. On one occasion when I was walking past the waiting area to deliver a chart, a patient asked me if she could see her chart. Everyone was appalled, as if asking such a question were as egregious as me picking up her chart and reading it aloud. I apologized and said that it is against hospital policy.

Six months later, I was "promoted" to the Medical Day Center, where there is much more patient contact. At first, like in the Outpatient Department, the charts were all gathered in numerical order on a trolley behind the secretary's desk. Whenever a physician needed a chart, he would get it himself and then put it back. At the end of the day, sometimes, I would be in charge of pushing the trolley to Medical Records. But things were soon to change.

I fondly remember about a year ago, after six months in the Medical Day Centre, a kindly woman in a volunteer uniform dropped by the Medical Day Centre. She passed around a few pens with papers that rolled out detailing everything patients need to know about their rights. She said she was from the new Patient Advocacy Team. There were numbers patients could call if they felt their rights were being compromised, and a statement that said: "Every patient is allowed access to their medical records. If you would like to see your chart, drop by medical records or call this number to make an appointment." This was a pivotal moment in my experience as a volunteer; the peripateia that precipitated a revolution in how patient care and confidentiality of records was viewed. Or so I thought.

Things started changing slowly but surely in the Medical Day Centre - though I was unsure whether it was merely from an increase in awareness due to this newly implemented Patients

Committee or from new regulations regarding medical records altogether. The "chart trolley" got smaller and smaller, and charts started appearing on the small rolling tables next to the patients' beds, next to their lunch trays. They were free to peruse them at their leisure while waiting for the doctors to come.

Recently, after a conversation with a representative from St. Mary's Department of Medical Records, I found the answer. According to her, the observed trend did not reflect a change in rules, as they had always been the same: "If a patient ever wants to see their chart, they are supposed to make a written request to medical records. They'll set up an appointment to view the chart. The waiting room environment of the Outpatient Department, for example, is the reason why patients are not allowed access to their charts, as, unlike in the Medical Day Centre, it is not supervised by nurses and there is a risk that they or an accompanying relative will walk out with it. The charts are the property of St. Mary's, so they must remain here at all times."

This rule was evidently put in place to ensure absolute confidentiality, something that is taken very seriously at the MUHC. According to the representative at St. Mary's Medical Records, "Nobody is allowed to view your file without your written consent, so letting patients see their charts whenever they want also adds a small risk of the patient accidentally leaving the chart behind for other people to look at."

Even doctors are not allowed to view a patient's chart without the patient's written consent. Meaning, any doctor in the hospital who is not following a particular patient is not allowed to see their chart with only one exception: If an emergency warrants immediate action, the doctors taking care of the situation are allowed to see the charts under the clause of either "inferred" or "forced" consent [1]. The former means that it is assumed that the patient would allow the doctor to see his or her chart if this patient were old enough, conscious enough, in less acute condition, or of sound enough mind to make the decision; and the latter means that the patient would be a menace to society if consent is not forced (Hunter v. Mann[1974]).

Confidentiality is absolutely crucial for any medical system to work, as, "if clinicians were not required to keep confidence, people would be reluctant to provide them with personal information about their physical and mental health. In the case of psychiatric patients, a proportion of whom might also be dangerous.[1]"

Anyone with statutory right of access is allowed to see his or her personal data [1]. In Quebec, this refers to anyone who is 14 years of age or older and is not a ward of the state. The Quebec Health and Social Service Ministry states that you are also allowed to request a hard copy of your chart free of charge, provided you have the proper identification (your RAMQ Health Insurance Card).

The year 2011 marks a pivotal year for medical recordkeeping in Quebec. Starting this year, paper medical records are going to be transferred to an electronic database [2]. This initiative, already commonplace in Europe and strongly pushed by both the Bush and Obama administrations in the US, hopes to reduce the cost and environmental impact associated with the collection and maintenance of paper records. CTs, MRIs, and X-rays, among other test results, are already in an online database at all McGill affiliated hospitals, so it seems perfectly logical for the rest of patients' charts to follow suit. However, such a large-scale change seldom comes without its opponents. Many people fear that placing medical records online would render them susceptible to hackers and other intelligentsia. The Quebec Ministry of Health and Social Service addresses and refutes this point, claiming it is not a legitimate worry as all information would be stored under tight security, and will be backed up in such a way that in the very unlikely event of hacking or system breakdown, an accurate copy of the records before their vandalism or breakdown would still be accessible [2]. Moreover, Dr. Brian Jacobs from the Childrens National Medical Centre in Washington, D.C., claims that the benefits of storing medical records electronically far outweigh the risks. He raises a valid point in stating "the root of most medical errors is miscommunication. With electronic records, we can prevent that." For instance, anyone who knows a pharmacist knows that it's definitely not a myth that a large proportion of doctors have illegible handwriting. With the new electronic system, prescription errors due to bad handwriting would be a thing of the past, and test results can be accessed quickly and easily by any practitioner who needs them [3].

The Quebec Electronic Health Records (EHR) website states that authorized health professionals who have at least limited access to your chart includes doctors, nurses, microbiologists, medical archivists and pharmacists, as long as they are personally responsible for your care. The government hopes to expand the list of "authorized personnel" to dentists, nursing assistants, podiatrists, optometrists and midwives. Another new development starting in 2011 is the restriction of your employer, insurance company, or person from seeking to have you sign a contract that requires a health assessment or to request even a partial copy of your EHR. This is for the purpose of alleviating any burden, financial or otherwise, that disclosure might cause. So if any employer requests access to your medical records, you are required by law to refuse them access without penalty[2].

For more information about your rights to your medical records, consult http://www.dossierdesante.gouv.qc.ca.

Alexandra Markus is a U1 student currently majoring in Physiology and double-minoring in Drama and Theatre and Social Studies of Medicine. Global health has always been a passion of hers, primarily thinking up creative yet practical ways of lessening the health burden in developing countries. This summer, she will be going to Peru with Patch Adams et al. to clown around, paint murals, and of course, run a clinic.

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Do Video Games Lead to Violence?

Emily Erkkinen

There is a world where "points" become synonymous with "kills", where these points are ones sole source of veneration, and existence atrophies into an unremitting cycle of kill, be killed, and repeat. This world is the virtual reality of violent videogames (VVGs). Thus begs the question: are videogames simply innocuous child games, or are they enactors of desensitization and creators of criminals? Gentile and Anderson (2003) in their article "Violent Video Games: The Newest Media Violence Hazard," allege that videogames promote violence. They attest that VVGs are inherently comprised of learning mechanisms that ingrain violent tendencies, including acting out complete behavioral sequences, active participation, repetition, reward systems, pervasive violent themes, and first person identification with a violent character. Specifically, they enumerate results such as decreasing prosocial behavior, and increasing blood pressure, aggressive thoughts, hostility, anxiety, frustration, and aggressive behavior. Olson(2004), in contrast, claims in her article "Media Violence Research and Youth Violence Data: Why Do They Conflict?" that videogames are benign.

She exposes serious flaws in VVG research tests, such as inadequate sample quality, the inaccuracy of artificial tests, inappropriate combination of tests in meta-analyses, and varying measurements of the abstract concepts of "aggression" and "violence." She states that without testing for violent people "selecting into" playing violent videogames, the studies results are not proven to be of significance.

With all the uproar about the negative effects of violence in the media, more researchers and policy makers should turn their focus to videogames, a growing industry whose revenue has now surpassed that of music and movies. As current research has shown, violent videogame content, design, and addictive qualities predispose gamers to subsequent violent behavior. As videogame usage rises, researchers should elucidate the detrimental effects that videogames could pose to our society, so that measures to offset the potential consequences can be taken.

Naturally, an observer forms violent

thoughts when exposed to violent images [1]. A person who has just heard violent discourse or observed violent behavior is more apt to speak or act aggressively because the response is more accessible in his or her mind. Therefore, the content of VVGs has the potential to produce negative effects. Various cross sectional studies [3], longitudinal studies [2], and meta-analyses[1] indicate that VVG content augments aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, aggressive emotions, and/or desensitization. This augmentation exacerbates subsequent violent behaviors. Despite conservative statistical procedures [1], critics snub these studies by selectively examining evidence, restricting their focus to negligible flaws, and overlooking cognitive learning theory [9]. For example, they harp on the debate of "selection" versus "causation" [12] but forget that selection and causation are not mutually exclusive [14]. A longitudinal study controlling for initial violence still found that exposure to videogames with violent content predicted later aggression [2]. Cross-cultural studies [1][2][7] further show that effects are causal in nature. For example, in Gentile's (2009) study, the United States, Japan, and Singapore all demonstrated similar effects from VVG exposure, even though the Eastern countries have a less crime-ridden culture.

These studies are pertinent because today 90% of American children play videogames at home [1], and 99% of boys and 96% of girls say they play videogames. Even people living at a low SES are exposed to VVGs [7]. The poor are already especially prone to developing mental illness. Since VVG content affects diverse groups, it can accumulate as yet another risk factor for already disadvantaged groups [11].

Although the short-term consequences of VVG exposure (such as physiological arousal and aggressive script priming) are well-known [1], critics assert that there will be only negligible long-term consequences, but consequences nonetheless [12]. On the contrary, VVG design enhances a pejorative learning process, deeply embedding violence into ones personality. Well-studied and widely-accepted mechanisms of learning that are present in videogames include active participation, repetition, and reward systems. Since VVGs are inherently interactive, a player is both a witness and an enactor of violence [2]. Frequently, VVG design necessitates that the gamer indefatigably decide to engage in harmful behavior to earn a reward, perpetuating a cycle of learning and reinforcement [7]. Moreover, "problems" encountered frequently offer only one solution: to act violently. This further reinforces the formation of a violent personality. Once these learning systems are in place, long-term changes in personality will presumably ensue. Longitudinal studies illustrate this by controlling for a person's initial aggressive personality levels. Test subjects who habitually play VVGs, regardless of their initial violent personality levels, experience intensified subsequent violent behavior [2].

Since videogames are highly interactive and take place from a first-person perspective, the gamer is inclined to become attached to his or her characters role in the virtual world [2]. Symbolic interaction theory hypothesizes that a person develops personal meaning by engaging in social interaction. This may span into situations of virtual interaction as well. Videogames can become a sort of virtual social world to the gamer. Since identities held by an individual influence one another because of the individuals network embeddedness, behavior learned in a virtual social context will bleed into real world social identities. If a gamer becomes deeply committed to his or her role as a violent videogame character, his or her violent identity will permeate his or her non-virtual perceptions and reactions [16].

While many studies have real-life measurements of violent or prosocial augmentation, such as willingness to assist a harassed woman [8], critics purport that ambiguous definitions of "aggression", "violence", and "prosocial" undermine the findings of such studies [12]. Regardless, if a person is labeled as "violent" they will still be pushed into further deviance [10]. Moreover, videogames prevent social ties from being formed when played in excess, thereby removing salubrious social support systems [13]. On average, American boys play 16-18 hours of videogames a week [2]. In addition to content and construct, time allotted to playing videogames can have detrimental effects on personality formation by detracting from time spent engaging in more prosocial activities. Addiction to videogames detracts from interaction with others, thereby impeding the formation and development of one's social identity. Addiction becomes a form of isolation from social circles, decreasing the amount of role sets formed. The less role sets formed, the more likely a person is to have a psychological disturbance, such as aggressive personality [1][16]. Furthermore, labeling a person as "aggressive" will have negative repercussions for his or her social networking and self-esteem, according to modified labeling theory. These consequences predispose the individual to further deviation from societal norms, thus enhancing violent behavior. The deviance becomes internalized [10]. Correlation has already been demonstrated between time spent playing videogames and poor school performance and social skills [2]. Since productivity is more socially esteemed than stigmatized videogames, a person lacking these socially venerated skills may fall further into the cracks of social deviance [4][16].

VVGs have negative consequences for social behavior through their content, design, and addictive qualities. Psychological research on VVGs benefits from utilizing sociological concepts to further elucidate how, when, and why VVGs impact the gamer, specifically by analyzing social interaction and labeling theories, social support systems, and the discrepant impacts across differentially vulnerable groups of people. For example, by studying VVGs differential affects on at risk populations (such as children and the poor), researchers may better be able to explain the magnitude of their results and incite institutional change [1][8]. To further gain public support, research should eliminate common experimental design flaws by lengthening the time period of longitudinal studies [2][1][3], using larger sample sizes [2][1], and construing a common definition for "violence" to make separate studies more comparable [1].

Once someone's deviance (eg. violent behavior) is affirmed through anothers reaction, the deviance can cascade into a self-fulfilling prophecy because of stigmatizations consequences, such as losing social ties [5]. Lack of social support is an integral factor in the pathway to violence, and is especially potent when there are other stress factors in operation, such as low SES [15]. The effects VVGs have on individuals could be reduced by reducing the stigma that comes with struggling with social skills, playing "nerdy" videogames, and perhaps acting violently [17]. Although remedying stigma is difficult since it is so deeply embedded in society, public information campaigns could increase community understanding of the reasons for the consequences of VVGs, and thereby diminish social support loss for the gamer [18].

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In Cancer's Genes

Pauline Helle, Co-President of Think Pink McGill

Recent and even controversial findings give an astonishing glimpse into the future of research, prevention and potential cure for breast cancer

Professor Anne-Lise Børresen-Dale, Head of Department of Genetics at the Institute of Cancer Research at the Norwegian Radium Hospital, specializes in molecular oncology of breast and ovarian cancer. She has served as Member of the Board of Directors in the American Association for Cancer Research (AACR), as President of the European Association of Cancer Research (EACR) and as Member of the Board, the European Cancer Organization (ECCO). Her publications include over 350 scientific papers and 30 chapters in books and invited reviews.

Professor Børresen-Dale is a pioneer in gene-based cancer treatment. By decoding the genetic material of a patient' s tumor, researchers can determine the tumor's "Achilles' heel," its weak point, and thus the optimal treatment. This approach is known as " personalized treatment" and may eventually lead to "personalized prevention," whereby researchers are able to foresee genetic dispositions towards particular diseases and prevent them from occuring. Hand in hand with her genetic research work, Professor Børresen-Dale works as an avid advocate for the development of translational sciences. Translational science refers to the concept of converting results from basic research into applied research and product development, also described as translating bench science into bedside clinical practice. With personalized treatment potentially redefining our approach and experience in breast cancer research, we asked Pr. Børresen-Dale ten questions about the future of breast cancer.

Think Pink: *What is the financial cost of codifying a patients genes in 2010 and can it be standardized?*

Pr. Børresen-Dale: Today, if we put this into the clinics it would be too expensive to be a standardized procedure. Partly because we currently are not able to reduce the time in finding the Achilles' heel which could lead us to the best treatment. This process is costly if we are going to do full mapping and sequencing of each cancer gene. Today, the cost is close to 20,000 dollars, but that is not all that is needed. What must follow is an extensive interpretation of the data and we do not yet know the best way of doing that.

Think Pink: *Do you think this technology will be something my generation could benefit from within our lifetime?*

Pr. Børresen-Dale: I definitely think so because the technology is moving so fast. The informatics, how you handle the data, is escalating. We get more and more sophisticated tools helping us to really see the structures in the data, revealing information which we haven't thought about at all. Then we may be able to identify the Achilles' heel in that particular tumor. The cost of sequencing a genome is moving down to 10,000 dollars and the aim is to get it down to 1,000 dollars within the next five years. As it is today we are still struggling to find the Achilles' heel in each patient. So for the time being what we need to do is molecularly characterize as many tumors as possible with good clinical annotations that we can use for further modeling.

Think Pink:*Do you see this technology ultimately leading to more of a preventive than a curative approach?*

Pr. Børresen-Dale: That is where we need to go to be able to effectively combat cancer. Indeed we need to do more to prevent it. We have for some time been talking about more personalized treatment, but we also have to dare to start talking about **personalized prevention.** It's not good for everyone to eat carrots everyday. You need to know "who is at risk for what?" This is ultimately the goal, but I think it comes together with knowing more about the cancer itself and what triggered that cancer in that particular patient. . We should not limit our research to the tumor but go on to acquire knowledge about the genotype of each patient and the patient's lifestyle and environmental exposure and ask the question: What kind of cancer did the woman with that genotype and that environmental exposure develop? This is part of a **whole system** of biology, and when you can decipher that for each individual, you may be able to predict the type of cancer that a particular woman might develop. At this point, you can start individualized prevention.

Think Pink: *Do you have other personal goals?*

Pr. Børresen-Dale: One of my dreams is to do an image type of analysis, without involving any invasive sampling, where you capture the status of all the molecular components and then get a high digitalized image that shows the structure. When you see a particular image, it will identify a specific type of tumor and the precise nature of its Achilles' heel. This will immediately tell you how to treat that patient. It may look like science fiction, but I really do think it is possible in the not too distant future.

Think Pink: *Are there any warning signs that one may develop breast cancer or other cancers?*

Pr. Børresen-Dale: I think the first thing to look for is the family history. If you have a close relative that had lung cancer and smoked, don't smoke! Physical activity prevents a lot of diseases including breast cancer so exercise and stay slim. Some infections may stimulate certain cells to grow, possibly occult tumor cells, and thus become a risk factor for developing cancer. The same can be said for surgery, which may also stimulate cell growth so avoid unnecessary operations. There are also reports that the healing process after injuries, for example in knees, may stimulate tumor cell growth. So I think we need to broaden our scope and to start looking at other diseases like diabetes, rheumatism and other autoimmune diseases to determine how they affect one's system and how that system affects the risk of cancer. Such studies are starting to take place. We see that similar genes may be involved in several different diseases, with the same genes affording protection against one type of disease but indicating susceptibility for another. It can go both ways. Again, we need to be much more open-minded when looking at the similarities between different diseases. As previously mentioned, we need to consider diseases at a systems biology level.

Think Pink: *The question of nature vs. nurture (genetics vs. lifestyle) remains an issue with breast cancer and cancer in general. Now we hear about anti-cancer food or that severe depression or anguish can trigger breast cancer is there any truth in all this?*

Pr. Børresen-Dale: It's never only environment; it's never only genetics. **It's a gene environment interaction all the time.** The younger you get the cancer the more likely it is that the genetics play a major role and the older you are it's more likely that the environmental factors are stronger. Take stress for example. Stress causes you to start to hyperventilate, you get anaerobic metabolism, and you get a lot of bi-products which may harm your DNA. If you have a very good repair capacity it doesn't matter. Then again, for some people stress is more dangerous than others; but for the time being we don't know who is and who isn't at greater risk. Similarly, I think nutrition may be protective for some people but not for all.

Until recently, it has been a big problem for epidemiology research aiming at finding risk factors for breast cancer that we have been looking at breast cancer as one single disease. We clearly know today that it isn't. The risks for the different groups are probably very different. If you look at smoking for example, it is quite interesting that some women, who carry mutation in the BRCA1 gene, have a reduced risk for breast cancer if they smoke! So their smoking works the other way around for the risk of breast cancer, probably by lowering the hormone level. But no one talks about that because smoking is bad, and of course smoking presents risks for many other diseases. Quitting smoking will always be beneficial for one's health; however, what is interesting to me is that it's not about smoking per se, but what smoking does to your body to reduce the risk for cancer in these individuals. That is what's important. It may lower your estrogen level and that again protects you if you have a high risk of developing cancer. We must **rethink for the individual.** But it's hard for a government to promote strategies that must vary for individual to individual and to be able to say, "this is good for this group and will work for them, but not for this other group that needs different advice." This problem gets even more difficult when dealing with a heterogeneous population.

Think Pink: *What is the upcoming main challenge for breast cancer research from a genetics point of view?*

Pr. Børresen-Dale: I would say that breast cancer is actually a success story. If you are diagnosed with breast cancer in Norway today, you have almost a 90% chance of being alive after 5 years, which is extremely good. On the other hand, we know that we do "**over-treat**" and that some individuals suffer severe long-term side effects as a result of treatment. The challenge is to identify those that need the heaviest treatment and those who can receive less and still survive. We have not really started to treat in a personalized manner yet. We do not dare NOT to treat. The treatment itself contains carcinogenic substances, and may cause development of a second cancer, so avoiding that is the biggest challenge. It has been estimated that by 2015, every 4th or 5th patient diagnosed with cancer will actually be a previous cancer patient having developed a second cancer as a result of the exposure from the treatment of the first cancer. If blood tests existed that could alert us to the presence of cancer formations at an early stage, and if there were tests that could monitor the efficacy of the therapy, I think we could prevent much of the over-treatment. We are not there yet, but we are working hard on this concept.

Think Pink: *What are the goals for translational science in breast cancer research and for patients?*

Pr. Børresen-Dale: Women are not mice so we need to do research involving women. We, the scientists, need to be able to follow the patients in order to produce new drugs and, by using them in early experimental trials, determine if the treatment is beneficial. So, a very close and good collaboration with the clinicians and with the patients is needed. We must explain what we are doing to the patients and give them the necessary knowledge so that they can make informed decisions on further treatment. We must work hard to educate the public. Lay groups could help in reaching out and that is why your (Think Pink) request was so interesting to me, because indeed you have to start with educating the young ones. They have to get the knowledge before it is too late. Many of the patients participating in research projects say "I don't do this for myself; I do it for my daughters." So the daughters should be aware; they should know what we are doing. In return they can be supportive. We need young advocates for our cause. We need to demystify cancer. People are living longer and at the rate of one in four contracting cancer in his or her lifetime we know that virtually every family will have to face this disease in some way.

The hope is not to have to not wait 10 years for the FDA to approve new promising treatments. We want to shorten the time between acquisition of new knowledge and possible new treatment. We need to dare to fail and go back again. Part of translational science and research is to be able to go back and forth between bench [science] and patient.

Think Pink: *What are some of the barriers of translational sciences cultural, linguistic?*

Pr. Børresen-Dale: One of the challenges is the internalization of the idea of translational sciences and being open about what you know. Some competition is always good, but sharing data and knowledge will enhance the field faster. You may experience having your ideas stolen by a competitor, but that might occur two or three times in a lifetime. The risk and personal harm is nothing compared to what you get back from being open! That is one of the things I really hope to see happen a more open **sphere of dialogue**, especially between the different professionals, the basic researchers, the clinical staff, the clinical scientists and, of course, the patients. If we could get this rotation of feedback and of **knowledge spinning, we would be much better informed much faster.**

Once, while working with a team at the Yale University, I experienced a challenging situation. There was a whole group of experts, including epidemiologists, oncologists, pathologists, radiation oncologists, molecular biologists and geneticists. Each had different information at hand with respect to the patient's genotype, exposure, family history, the size of the tumor, etc. They discussed how to best treat the patient based on all this information. After going through all the data and the possible options for the patient for a personalized treatment, a final question was asked: "what kind of insurance does she have?" Many of the treatment options that had been proposed had to be abandoned because of insufficient medical coverage!!! This is unfair!! Medical improvements for the patients are slowed down by non-medical factors.

Think Pink: *Do you have any advice for women between 18 and 25?*

Pr. Børresen-Dale: If you should be presented with a cancer diagnosis, be positive. I am certain that having a positive attitude during treatment affects how you experience it and fight it. Don't feel guilt, thinking "I should have" and "I shouldn't have." We still don't always know why cancer happens. I hope that one day we will be able to give that diagnosis, so the patient can get that relief, that answer. But today, we don't know.

Despite all the advances made in recent years and her promising research, Prof. Børresen-Dale does not hesitate in stating that, " we should not be nave and think we will eradicate breast cancer or cancer from the human population. Cancer comes from our genes. If we stop our genes from changing and developing, we are stopping evolution." On a brighter note, she adds that the next step is rather to change the outlook. "We hope to change how we will live with cancer. By 2015, 25% of the population will be affected by cancer at one point in their lives. We must learn not to die of cancer but how to live with it. The hope is to minimize the pain and suffering around cancer."

Think Pink is a student-run McGill club dedicated to raising breast cancer awareness and fundraising for the Quebec Breast Cancer Foundation (QBCF). For more information visit http://thinkpinkmcgill.ca/.