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Mandatory Measles Vaccination Program: Is There a Place for one in Switzerland?

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SIT Study Abroad

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Anne Rushman

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Abstract:
Vaccines are commonly cited as one of the most effective public health measures – they are not only effective, but they are cost efficient as well. Vaccines are implemented in both developed and developing settings, but the focus on increasing vaccination coverage typically is centered on the developing world. While it is important to continue to increase vaccination rates in developing countries it is also important to maintain or reach herd immunity in developed countries. Switzerland, and the recent measles outbreak there, serves as an example of the importance of placing a focus on [measles] vaccination in developed countries. In the wake of this most recent measles outbreak, the discussion of making the measles vaccine mandatory had commenced. This paper explores the possibility of making the measles vaccination mandatory specific to Switzerland's unique health care system while taking into account the medical opinion from both the alternative and contemporary perspective. It also explores the state of measles vaccine coverage and programs in other developed nations. In conclusion a mandatory measles vaccine program in Switzerland is recommended, but not without hesitation to how it may be adapted in the Swiss health system.

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Preface

The investigation of this topic began as a curiosity from the measles outbreak in the canton of Vaud, Switzerland in early 2009. As I began to gain a deeper knowledge of the subject of measles and measles vaccination in this community I saw the potential it held as a topic to explore my interests in the juncture of public policy and public health. As I approached the topic of measles vaccination from not only a public health perspective but also from that of political and ethical perspective I was able to make an analysis of potential changes in the health policy of Switzerland for a mandatory measles vaccination. The following paper details my efforts to explore the potential of a mandatory measles vaccine in Switzerland.

Mandatory Measles Vaccination Program:
Is there a place for one in Switzerland?

Introduction

Vaccines are widely touted as one of the most effective public health measures.[1] They are cost effective, becoming easier to transport and deliver, and have high efficacy rates when delivered to high rates of the population. The smallpox virus has been eradicated worldwide due to the development and then successful global implementation of a smallpox vaccine. This is the most drastic result of a vaccination, eradication, but there are many other successes we have seen from vaccines. Childhood deaths and disease burden has been lowered due to vaccinations. While it is a wide spread belief that vaccines are an effective tool in combating vaccine preventable diseases and are a promising venue for research in disease prevention in the future there is an increasing backlash against the vaccine movement.

While the focus in vaccine delivery has been on the developing world for quite some time the developed world in many areas has gone backwards in vaccine coverage rates and a resurgence of previously almost non-existent diseases is on the rise. The focus when studying vaccines has been to the developing world, how to make transportation to remote areas possible, training personnel to administer vaccines, simplifying the vaccine delivery process and achieving herd immunity. While the focus on the developing world is important, the developed world has its own set of problems that must be addressed as well. This calls for a new look to vaccination in developed countries and perhaps a new approach to promoting vaccination.

[1] Feudtner et al 2001 pg 1158

The focus on developing countries is important, and must concurrently continue. Developing countries have a low vaccine coverage rate, which leads to high disease incidence. The effects of this are seen at a greater extent because in these locations they are also suffering from poor health infrastructure and care systems. This makes the consequences of vaccine preventable diseases more serious and a higher percentage of deaths occur because of them. Because the results of not being vaccinated are much more grave in developing countries they receive the bulk of attention when discussing vaccine preventable diseases. Since developing countries are the focus of research and the US mandatory vaccination program is still quite effective I assumed that vaccine preventable diseases were not of great concern or occurrence in developed countries.

Upon my arrival in Switzerland this belief was quickly set aside as newspaper headlines daily depicted the measles outbreak in the canton of Vaud, where I was living. This contradiction to my previous thoughts and knowledge sparked my interest and encouraged me to investigate and research why Switzerland, which is typically thought of as a very healthy nation, is not successfully implementing one of the most effective public health measures. There is no excuse for not maintaining high levels of vaccination coverage and low disease incidence in developed countries, as there is a highly effective vaccine for measles. The health and economic consequences of vaccine preventable diseases are high, and avoidable.

This original curiosity led me to investigate the current situation in Switzerland surrounding measles and the measles vaccination. This went beyond just looking at measles and vaccination, but to look deeper into the various levels of the issue and the range of stakeholders in measles vaccination.

An important aspect of my research, to develop not only the context but also the possibilities for the future, was the Swiss health care system. This entailed looking at how the Swiss health care system is governed, which is a very different system that the United States. Power is very decentralized in all aspects of Swiss government, including the health care system. Each of the 26 cantons are in charge of their own health care infrastructure. While one can argue that this system seems to work for the Swiss, it makes creating and implementing policy very difficult on a national level. This is key when trying to eliminate highly contagious diseases such as measles in a globalized world full of human movement both internationally and nationally.

I then took to looking at measles vaccinations through an ethical perspective. This is an important aspect to regard as I began to look at the prospect of a mandatory measles vaccination program in Switzerland. The decisions that are made as to whether it is more important to maintain individual autonomy and ones right to chose their health outcomes, or regulate individual choice for the health of a community. This dilemma of which rights, that of individual autonomy or community health, is superior is at the center of discussions about measles vaccinations and whether they should by mandatory.

Switzerland's unique governing system and low vaccination rates led to a curious investigation of how a mandatory vaccination program might fit into not only the health care system in Switzerland, but also in the society. My research took me through an analysis of the Swiss health system, other developed countries vaccination programs, the medical, both contemporary and alternative, perspective of measles, and the school as an integral part of the health system. The combination of this research brought me to the conclusion that there is a place for a mandatory vaccination program in Switzerland, but the development and implementation of such a program would have to take into special consideration the

situation in Switzerland. It would require changes in many levels and organizations of Swiss society. Because of the broad range of changes that would need to occur support from many levels would be critical – from the government both politically and economically, the community, the health sector and schools. Since the Swiss government is so decentralized it is perhaps far fetched to believe that changes could be made on a nation-wide level to implement a mandatory vaccination program. Though it would elongate the process, and take longer to see results, the most logical and plausible solution would be for a bottom up approach, some of the more progressive cantons would implement a mandatory vaccination program that would eventually be implemented in all 26 cantons.

Methodology

To be able to come to an educated and logical conclusion on the potential role of a mandatory vaccination program it was essential to examine the situation from a variety of perspectives, institutions and parts of Swiss society. Beyond examining the situation in Switzerland I found it invaluable to become familiar with how other developed countries, similar to Switzerland had successfully or unsuccessfully tried to increase measles vaccination coverage. By looking at the issue from a variety of perspectives both from within and outside of Switzerland I was able to evaluate the pros and cons of making the measles vaccination mandatory and some of the potential barriers to making measles vaccination mandatory in Switzerland.

Swiss Health Care System

The first facet to discuss is Switzerland – its government and its health system. While this wasn't my initial avenue of research, I find it an important underlying factor when examining the other perspectives. As mentioned previously the Swiss government is very

decentralized, since the adaptation of a federal constitution in 1848 the majority of the responsibility for health was put to the cantons, so the cantons have separately formed the Swiss health system since then. [2] Switzerland spends more as a share of GNP than any other OECD country, other than Germany and the US, but has a much lower estimated vaccination coverage for measles. It is estimated that there is around 82% coverage for the measles vaccination in Switzerland where as the OECD average is 91%. [3] The cantons are widely realized at those with the responsibility to develop and implement health-policy, by leaving the responsibility up to the 26 individual cantons has led to 26 slightly different health systems, all under the common thought of the Swiss health system.[4]

Looking more specifically at the health system in Switzerland requires examining each canton as an individual system. While regionally Switzerland varies to a greater extent the farther apart the cantons are, for this introductory study the examination took place of the canton of Geneva and the canton of Vaud, neighboring cantons in the French speaking area of Switzerland. When looking at the canton's of Geneva and Vaud I looked specifically at how vaccines were distributed and how this was managed and governed. Focusing on these two specific cantons was not only important as they serve as leaders in the realm of vaccinations, but also these two cantons allowed me the greatest opportunity to interact with professionals in their respective health systems. These are two of the cantons with the highest vaccination coverage rates in Switzerland.[5] The way that these two cantons choose to manage their health care is very different for vaccinations. Both cantons combine the education system and the health system, but for Geneva the health system is managed by the

[2] OECD Reviews of Health Systems: Switzerland, page 18
[3] OECD Reviews of Health Systems: Switzerland, page 18; page 76
[4] OECD Reviews of Health Systems: Switzerland, page 29
[5] "Santé en Suisse" 25 April 2009

education system, whereas in Vaud the education system and the health system manage side by side.[6] The biggest effect this has is on what type of emphasis is placed on vaccination programs and ensuring that prevention efforts are a priority.

Medical Perspectives

With the focus of the Swiss health system as a constant background to the research and investigation into the medical perspective was more insightful. I was able to apply their thoughts to the specific setting of Switzerland, and more specifically to the cantons of Geneva and Vaud. This was also an important research aspect as it was where I was able to be most interactive in my setting. I was able to not only discuss the medical and public health benefits but also discuss them specific to a Switzerland context.

An earlier observation and investigation of the Swiss health culture led me to investigate the large following and emphasis on alternative and homeopathic medicine. As this is a critical part on many individuals health care I reasoned that this alternative health care sector would also play a valuable role in vaccination coverage. Thus I investigated not only contemporary medicine's view and practice with measles vaccination, but also paid close attention to how measles vaccination was dealt with in alternative or homeopathic medicine practices.

From a contemporary medical perspective the measles vaccine is preferable. This conclusion is arrived at from a risk-benefit analysis. The risk you take on from receiving the measles vaccine are minimal, especially when compared to the benefits of immunizing yourself against measles and the potential complications from contracting measles.[7] Another aspect to look at is not only the individual's health, but also the health of the community or

[6] Duppereux, Olivier 14.4.2009
[7] Seigrest 14.4.2009

population. When making this analysis for the benefit of the health benefits for an individual and the benefits for the community there are substantial benefits for both. The individual protects himself or herself when vaccinating against measles, and with a higher number of individuals vaccinated it protects the entire community. This calculation of benefits becomes complicated though because herd immunity, the level that must be obtained to protect the entire population, is below 100%. For measles, herd immunity is reached at a level of 95% vaccination coverage since it is a highly contagious disease. Since a community can be protected without 100% measles vaccine coverage this allows for free riders, and as an increasing number of people rely on the rest of the community to keep them measles free herd immunity is not established thus leaving the population at risk of infection.

For homeopathic medicine there is not a clear answer for either pro or anti measles vaccination. The opinion, and intensity of the opinion varies between homeopathic doctors and from patient to patient. The homeopathic doctor that I was able to interact with focused on a more holistic view of his patients, which led to a varied analysis for each patient. It is more important to look at the health of patients from all angles, and for some it will be more beneficial to be vaccinated and for others the risks associated with vaccinating are not worth it. [8] The calculation of risk-benefit from the homeopathic perspective is very different, thus the analysis has a different conclusion, because they see the risks and benefits reaching beyond just getting measles or not, or getting side effects from the vaccine or not, but extending to the mental well being of a patient and their philosophical beliefs.

When discussing the measles vaccine with Dr. Loutan, and how he approaches the topic and deals with it in his practice, he took me through a few scenarios and criteria to

[8] Loutan 9.4.2009

consider. He approaches it as a discussion with the patient, looking to see first whether they are initially either for or against vaccinating their children, as is normally the case with measles vaccination. He never just takes a "no" answer to the measles vaccine, as he sees it as very important to discuss the reasoning of why one chooses not to vaccinate. He wants to make sure the patient has thought it through and that both parents are comfortable with the decisions being made. This is important for the well being of the child so that if the child does contract measles the parents will treat it in an appropriate manner as a team of parents rather than divided.

Case Studies

Having an understanding of the Swiss health system and the knowledge from both the contemporary and alternative medicinal viewpoints I investigated what other types of policies and actions other nations have developed and implemented. I focused on other developed nations that have established health care systems that used a variety of methods and programs – both mandatory and voluntary. This was a more distant type of research as I was researching vaccine programs from settings I was not present in. The reading of reports on these programs was valuable in considering what options were available for Switzerland and what could potentially work.

Australia – Financial Incentives

The country of Australia implemented a policy with the hope of increasing vaccination coverage through financial incentives in 1998. The goal was to provide financial incentives to parents to encourage age appropriate vaccination.[9] One type of financial payment parents who appropriately vaccinated was a payment to the parents and the other

[9] Lawrence et al. 2004 pg 2345

type of financial incentive was linked to childcare, if children were appropriately vaccinated and the parents worked payments were made to aid in affording certain types of childcare. This was the first study to examine whether the prospect of financial payments made an impact on a parents' decision to immunize. Their findings concluded that where parents were informed about the incentive payments there was a significant association with a child's immunization status.[10]

Finland – Strong Elimination Program, is it sustainable?

Finland began a strong elimination campaign of measles, mumps and rubella (MMR) in 1982 – and successfully eliminating measles and mumps in the late 1990's, now though they are seeing perhaps a reversal with new cases popping up.[11] The program focused on ensuring that each child received two doses of the MMR vaccine. The choice to vaccinate was entirely voluntary, and the vaccines and delivery of them were free. The success in eliminating measles, mumps and rubella they accredit to the efficacy of the vaccine, an already established primary health system, motivated personnel, a well-organized and guided project, and the small population of Finland.[12] There is concern though that as measles has been eliminated for over 10 years it has been observed that antibody levels are lowering as well as the fact that vaccination levels are lowering.

US - Trial and Error to achieve elimination

The United States aimed to reduce and then eliminate measles from the introduction of the measles vaccine in 1963. [13] It took the United States many years, and many changes in

[10] Lawrence et al. 2004 pg 2350
[11] Peltola et al. 2008 pg 796
[12] Peltola et al. 2008 pg 801
[13] Hinman et al 2004 S17

their strategy to eliminate measles. One major concern with eliminating measles is maintaining high vaccination coverage, the US did not account for the maintaining of the high coverage and dropped funding for the measles vaccination just six years after the vaccine was introduced, and fewer than half the states had any type of immunization requirements.[14] In the early 1970's the focus of measles vaccination was lost and not surprisingly there was a rise in the incidence of measles infection.

This increase in measles cases instigated a new childhood immunization program that focused on increasing government support at both the state and federal levels.[15] There was initial success in increasing vaccination coverage rates and more lofty goals were established – a date was set for eliminating measles. School entry immunization requirements were set; this helped in regulating and enforcing vaccination and also with documentation and record keeping. There has been frequent discussions surrounding the legality and ethical dilemma of mandating vaccinations but, "the United States Supreme Court has upheld the right to pass mandatory immunization laws on two different occasions."[16] Though there was an increase in measles vaccination coverage, there was also a continued incidence of measles that led to studies about the effectiveness of the vaccine. It was concluded that a second dose of the measles vaccine would improve coverage and protection from measles, this led to a recommendation for a second dose of the measles vaccination for school aged children.

After a measles outbreak at the end of the 1980's there again was a refocusing and change in strategy to work towards measles elimination. This was realized through an increase in funding and an improved childhood immunization program that included two

[14] Hinman et al. 2004 pg S18
[15] Hinman et al. 2004 pg S18
[16] Wilson et al. 2005 pg 511

doses of the measles vaccine, as well as increased surveillance and a formal reporting and response strategy.[17] Though it took the US several decades to reach a state with measles here they can call themselves measles free the governmental and financial support to the goal as well as using the school system as a way to enforce and track vaccination records were the factors that led to their success. Having elementary school vaccination laws has been proven in recent years to increase vaccination rates and decrease the incidence of vaccine preventable diseases.[18]

UK – A battle with public response to the link between autism and vaccination

In 1998 a study was released by researchers in the UK about a possible link between autism and vaccination. This report was picked up by the media and became well known to the public, which took into question whether this added potential risk made vaccination a viable choice. It did not take long for the measles vaccination coverage rates to drop, bringing communities below herd immunity and in time, by 2004, there were large outbreaks occurring throughout the UK.[19] Not only did this report cause parents to question whether the measles vaccination caused autism, but a recent study in New Zealand revealed that "one-third of health providers in New Zealand still had significant uncertainty about whether MMR caused autism."[20] The consequences of this report were extensive and shook the health system in the UK for how to handle the report that the MMR vaccine caused autism.

The considerations that were taken when trying to boost vaccination coverage rates after the damage done from the report linking the measles vaccine and autism are similar

[17] Hinman et al. 2004 pg S20
[18] Wilson et al. 2005 pg 512
[19] Burgess et al. 2006 pg 3921
[20] Burgess et al 2006 3921

contemplations taken into account when trying to reach herd immunity in any situation. They deemed it important to maintain parents' autonomy in the decision to vaccinate or not, be conscious of the various sides of the debate and acknowledge the concerns surrounding them, and be able to communicate effectively your message to the public.[21]

Germany – What happens when measles vaccination is not a priority

Germany does not have a mandatory vaccination program, but they do document vaccination status at school entry.[22] A survey of measles vaccination coverage was analyzed after an outbreak in 2006, the high cost, both economically and otherwise on a society and health system, of responding to a measles outbreak is noted as a primary concern for increasing measles vaccination. Since vaccination is not mandatory in Germany the records that are gathered at school entry are voluntary and are thought to be skewed numbers as those who have been vaccinated are more likely to present their vaccination record than those who have not been vaccinated.[23] The survey after the outbreak suggested that forgetfulness and rejection were the two most common reasons for a child not to be vaccinated. The situation in Germany is worrisome as it extends beyond having outbreaks, but Germany does not have a plan to increase immunization coverage.[24]

It is recognized that there is no plan in place and that this does not put Germany, or Europe in good standing for meeting the goal of eliminating measles by 2010. The researchers in this post outbreak survey suggest that the "Introduction of mandatory vaccination or the imposition of sanctions on families with unvaccinated children is likely to

[21] Burgess et al 2006 3926
[22] Wichmann et al 2009 108
[23] Wichmann et al. 2009 pg 112
[24] Wichmann et al. 2009 pg 112

be legally and culturally accepted in Germany."[25] They also suggest several other alternatives to increase vaccination rates, and perhaps quicker; requiring vaccination for entry into day care, incentive payments to physicians and or families, implementing catch-up vaccination programs, and an increase in governmental and political support.

Analysis

Swiss Health Care System

The decentralization of the Swiss health system poses a problem for putting forward a united front in response to health issues. Furthermore the Swiss government has "never defined explicitly the overall objectives of the health system or defined standards and measures to assess whether these goals are being achieved."[26] This shows that the Swiss health care system poses problems at each level of policy development and implementation.

This decentralization of the health system already poses problems with the existing framework in place with regards to measles. The most recent measles outbreak in Switzerland initiated a response from the federal government; they sent a plan of action for reporting and containing cases of measles within their cantons. Though this came from the federal government, it did not hold much weight with individual cantons as only a few cantons followed these guidelines.[27] Another recent vaccination policy that the federal government attempted to influence from their perspective was the HPV vaccine. They recommended to each canton that they develop an HPV vaccine program to educate their communities and make it available.[28] This resulted in many different types of programs, some not doing anything, with varying levels of success and no federal oversight. The

[25] Wichmann et al. 2009 pg 112
[26] OECD Reviews of Health Systems: Switzerland, page 29
[27] Seigrest 14.4.2009
[28] Cuénod 10.3.2009

formation of the Swiss health care system is best suited for a bottom up approach where cantons take control of issues, but to achieve national success and health responsibility and action from the federal government is necessary.

Medical Perspectives

The contemporary and alternative medical communities have many similarities when it comes to measles vaccination – they both want what is best for their patients and feel that measles vaccination can be an avenue to accomplish this. This conclusion is arrived at differently, and in the case of alternative medicine it is not so generally applied. The important calculation and analysis that comes from the medical perspective is the risk-benefit analysis.

The risk-benefit analysis that is calculated from the contemporary medical perspective is straightforward, where as the alternative approach is holistic in nature so it becomes much more complex. In the contemporary analysis the only risks and benefits that are acknowledged are those directly associated with the measles vaccine or with contracting measles. This analysis one could argue is more accurate, and I for one believe it is a satisfactory evaluation to generalize whether the measles vaccine is an appropriate public health measure for both an individual as well as for the community. In the risk-benefit analysis of the measles vaccine from the contemporary perspective the vaccine is beneficial to both the individual and the community.

When the alternative medicine community conducts their risk-benefit analysis of the measles vaccine it is necessary to conduct this on an individual basis. They look primarily at the risks and benefits of the individual, not taking into account the community for this calculation. While their concerns for an individual's health are valid, the emphasis on the consequences beyond the measles disease are perhaps thinking too widely. Also, the benefits

of vaccination, including the measles vaccine are for the greater good of a community and these considerations deserve a large part of the risk-benefits analysis.

Case Studies

When looking to apply the lessons learned from these other case studies to Switzerland it is difficult so broadly assume that practices can be applied from one scenario to the next, but it is helpful to analyze what worked and didn't work in other contexts and then evaluate as best as possible if it can be translated to the Swiss system. Starting with the financial incentive program that was implemented in Australia. My first reaction to this type of program was confusion, I was confused as to how paying people to perform certain medical practices was ethical. This seemed to be a breech of ethical medical practices, as it put pressure on individuals to act in a certain way and obtain certain medical interventions. It also places more pressure on individuals in economically unstable situations.

While I assumed that using incentive payments to increase vaccination coverage rates would not be effective in developed countries where payments would need to be quite high to have an influence on parents, but the research in Australia showed that the knowledge of the payments increased vaccination rates in children. In discussions with Dr. Duperrex we discussed the difference in providing incentive payments to patients versus payments to physicians. Dr. Duperrex felt the ethical dilemmas intertwined in incentive payments were difficult, but that the they can be effective and ethical for patients, but there is more of a gray area in providing incentive payments to physicians.[29] Dr. Seigrest also felt that though it

[29] Duperrex 14.4.2009

was natural to have the immediate reaction be to question the ethics of incentives, they can be useful as a motivation factor.[30]

Both the experiences of the US and Finland emphasized the need for political and economic support for a successful elimination of measles. I have always felt that the government plays an essential role in carrying out health policy and achieving health care goals. These examples emphasized that the role of the government is crucial in achieving higher measles vaccination coverage. While both governments eliminated measles through their respective programs they did so in very different ways.

Finland was successful with a voluntary program that emphasized education and utilization of their existing health care structure to achieve elimination. Though Finland attributes it success to many factors that it shares with Switzerland – small population, health care at a community level and strong base of health care workers – the success of their efforts are coming into limbo.[31] Though Finland was able to reach a level of vaccination that eliminated measles the voluntary status of their program is making it difficult to sustain high measles vaccination coverage. Though their strong support from their government made it possible to eliminate measles, it seems that their policy did not take into account maintaining measles elimination status.

The United States on the other hand eliminated measles, and is continuing to exhibit measles vaccination coverage at levels that will maintain elimination. Though the United States took three decades to eliminate measles, it is also a perfect example of the importance of government support. The United States went through many phases of their elimination strategy, and had many downfalls to their early successes. Anytime the government removed

[30] Seigrest 14.4.2009
[31] Peltola et al. 2008 pg 801

measles vaccination/elimination from the agenda and dropped funding of vaccination programs, vaccination coverage would lower and measles incidence would rise.[32] This emphasized the importance of continued support for a government, not only in terms of policy but also in economic support.

The UK and Germany are examples of countries that have, like Switzerland, struggled to get measles incidence and vaccination under control. The lessons learned from the case of the UK is the importance of communication and trust and from Germany the importance of making measles a priority by putting it on the agenda and having an action plan for it. In the UK the study linking autism and vaccination shook the entire vaccination system in the UK, and around the world. It raised skepticism to the benefit and risk balance as well as brought into question whether doctors were considering an individual's health. This can be a lesson learned that forming a trusting relationship with patients, and acknowledging concerns and risks of vaccination are much more helpful than ignoring that the concerns are there. Though the risk between autism and vaccination have been disputed and the measles vaccine has proven effective skepticism still exists, even in Switzerland. When discussing with Dr. Duperrex current issues with vaccine delivery in Vaud he cited the hesitation and disapproving recommendations from nurses.[33] He mentioned the problems that they are having with nurses discouraging vaccination because of their own personal beliefs. This is a difficult issue to identify, and resolve, but is a real concern.

In Germany the lack of acknowledgement, prioritization or action surrounding measles and measles vaccination has meant frequent outbreaks of the disease putting strains on the health and education systems. This has to be a warning to Switzerland that a lack of a

[32] Hinman et al. 2004 S17-S21
[33] Duperrex 14.4.2009

national action on measles and the measles vaccine will only lead to more frequent outbreaks, higher costs, and a less productive society.

Policy Recommendation

When looking to develop and implement a new health policy, or more specifically in this case an immunization policy, it is important to look at a variety of categories. Using the approach from Feudtner and Marcuse the analysis can be broken down into three main considerations.[34] These three focus areas are the disease, the vaccine, and the effects of the policy.

Starting off with the disease – measles – it must be looked at through two viewpoints, the individual and the community. This is where a lot of the previous discussion on risk-benefit analysis becomes relevant. In terms of the individual and the disease, measles, you look at the likelihood of the individual getting measles, and then the subsequent consequences. Measles is a highly contagious disease, so without vaccination in a population where measles is present an individual stands a large risk of contracting it. Once an individual contracts measles there is not a treatment for it, which strongly supports a prevention perspective for it.[35] While current medical advancements that are widely available in the developed world make fatality from measles not very common there are still complications, such as encephalitis, that can occur because of measles. When examining measles and the community it is important again to note it's highly contagious nature. Once measles is present in a community it is likely to spread throughout the un-immunized population, it is estimated that in an un-immunized population 90-100% of the individuals

[34] Feudtner and Marcuse 2001 1160
[35] "Weekly epidemiological record: Measles Vaccine." 2004 pg 135

will become infected if measles is introduced.[36] Another important consideration for the community in relation to measles is the cost, and examining the cost of infection. The cost of measles infection varies greatly depending on side effects and whether hospitalization is needed, but when examining the costs it is important to remember that measles is a vaccine preventable disease, and through vaccination these costs can be avoided. For an estimate and example of the cost of the measles vaccination a recent study of the 2006 measles outbreak in Germany reveals that the average cost of a measles case in that outbreak was €520 for each of the 614 cases.[37]

Now moving onto the second consideration of the vaccination itself, here it is important to look at how effective the vaccine is, what level is needed for herd immunity, the possible side-effects from the vaccine, the possibility of eliminating measles, and the cost of vaccination. The measles vaccine is highly effective; if an individual receives the recommended two doses of the vaccine it is about 99.4% effective.[38] Since measles is very contagious it requires a large coverage rate, around 95%, to reach herd immunity and be able to eliminate measles.[39] The side effects from the measles vaccine are not common and usually are limited to a rash or the like. A report in the late 90's linking autism with vaccination was a major set back until the results of the study were disputed in 2004, but was important in showing that a community has its limits in the amount of risk they will take on to vaccinate. Eliminating measles worldwide will be difficult, if even possible, but it has already been eliminated in some regions/countries. The cost of the measles vaccine is low, and cost is not prohibitive in developed countries such as Switzerland. Previous cost-benefit

[36] "Weekly epidemiological record: Measles Vaccine." 2004 pg 132
[37] Wichmann et al 2009 110
[38] Wichmann et al 2009 108
[39] "Measles Immunization Coverage in the WHO European Region" 2009 pg.1

analysis of the measles vaccine has shown that the measles vaccine "saves more lives per unit cost than any other health intervention."[40]

The final consideration to examine is the policy related issues, here it is important to look at individual autonomy in health choices, distribution of benefits and burden, the health of a community. The overarching goal of this part of the analysis is balancing the rights and health of an individual with the rights and health of a community. Individual autonomy is an important right and must be considered when considering forcing a type of medical intervention. This is why it is important to look at community opinions of a mandatory vaccination program and the amount of force that would be required to enforce. It is estimated that about 80% of the population freely chooses to vaccinate without hesitation, 5% adamantly opposes vaccination for religious or philosophical reasons and 15% of the population is neither for nor against vaccination.[41] These statistics show a fairly high consensus for vaccination and that there is a very limited population that would feel any type of force in implementing a mandatory vaccination program. The benefits felt by a mandatory vaccination program would be on both an individual level, as individuals would be protected, but also at a community level as it would facilitate herd immunity being reached. The burden of a mandatory measles vaccination program would placed on those who experienced any type of side effect from the disease and on a much broader level the burden of paying for a mandatory vaccination program would be felt by a larger part of the population. This balance of rights of an individual and a community and benefits and burdens show that a mandatory measles vaccination program in Switzerland would be beneficial to individuals and the community.

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[40] "Weekly epidemiological record: Measles Vaccine." 2004 pg 135
[41] Seigrest 14.4.2009

Overall, through the examination of these three main considerations of an immunization policy for measles – the disease, the vaccine, and the policy, show that measles is a well-suited disease to implement a mandatory vaccination program in Switzerland. It's a highly contagious disease that can be effectively controlled through the preventative use of a vaccine, which is also cost effective. A few individuals would absorb the burden from the side effects of the measles vaccine, which are low, but would still unfortunately be present. It would be important for a support system to be available to absorb some of these burdens so they were spread out rather than focused in on a few individuals.

This thoughtful and thorough analysis is important to practice. This is larger than just the debate on a mandatory measles vaccination program, but extends to other existing vaccinations and more importantly will play an increasingly important role in the future as new vaccinations arise. As new vaccinations reach the market and are recommended, this increases the number of vaccinations an individual is faced with. Now with recommended childhood vaccines reaching double digits, "immunization fatigue" is not uncommon.[42] This raises the question of whether immunization fatigue is a valid concern or issue, and if so how do we prioritize vaccination recommendation. This is where this careful three-part analysis has the capability to play a large role in the future of vaccine recommendation.

Proposed Solutions – *A way to make a mandatory measles vaccination program work in Switzerland*

One important step that can be taken at the federal level is the financing of the measles vaccination. Though the cantons are individually in charge of health-care the federal government is responsible for the insurance system.[43] Since the federal government is in charge of the insurance system they have the ability to change how insurance coverage

[42] Seigrest 14.4.2009
[43] OECD Reviews of Health Systems: Switzerland, page 18

works, and for what the mandatory insurance covers. Switzerland has a very high number of its citizens covered by health insurance as it is mandated. If the federal government would alternate the insurance system so that starting at the most basic health insurance package all vaccinations, including the measles vaccine, was completely covered this would help two fold in the process. It would first ensure availability and accessibility to the measles vaccine to the population and secondly it would help to show the position of the government in the matter of measles vaccination.

Another important action the federal government can take is establishing a strong position, and communicating this to the public. Though the federal government in Switzerland lacks the ability to develop and force implementation of a mandatory, or any type, of measles vaccination program they still hold weight with the public. The federal government must realize this power they hold in swaying the public's opinion and influencing their actions. The UK has already seen the weight that those in high government positions can hold with the public. After the controversial research that related autism and vaccination the public was very wary of vaccinated their children and felt that the government's silence on the issue was a sign that they too feared the possible effects of vaccination, but once the link was disputed the then Prime Minister, Tony Blair, made clear statements that he supported vaccinations and vaccinated his son.[44] This communication – through statements to the public and actions, by the government and government officials were helpful in regaining the trust of the public in regards to vaccination and subsequently raising vaccination rates, this too could be effective in Switzerland.

Looking to the cantonal level, where policy can be developed and implemented is at the core of starting a successful mandatory measles vaccination program in Switzerland.

[44] Burgess et al. 2006 pg 3926-3927

Much like how the US developed the two-dose aspect of their vaccination policy, state by state.[45] While implementing a program on such a small scale would be frustrating as it is harder to see the results, it would allow for perfection of implementation before wide spread execution. Within Switzerland the canton of Vaud would be an ideal place to start the implementation of a mandatory measles vaccine program. They already are a leader in vaccination, as they are one of the few cantons that already have increasing vaccination coverage as a priority in their health care agenda.[46]

The success in lowering measles incidence and the ease of running a mandatory vaccination program would hopefully spread quickly to other cantons. Another reason that the canton of Vaud is positioned well to be a leader in health care policy is that their cantonal health minister, Pierre-Yves Maillard is also the head of the canton health ministers and is in a position of power for the collective governance of the cantonal health ministers.

The most effective way to implement and then enforce a mandatory vaccination program would be through the school system. This is an existing structure set up by the government where large numbers of the population already move through.[47] The age at which an individual enters daycare or school is appropriate for when many vaccinations should be delivered by, school records are already kept so adding vaccination would be convenient and beyond record keeping, schools could be a place where vaccinations can be distributed. While this system would add an extra strain on the school system, and give them another responsibility, it is something the government can aid in, and should do so willingly as it would be much more economically sound to add to an existing structure rather than make a new one just for vaccination records and delivery.

[45] Hinman et el 2004 S21
[46] Duperrex 14.4.2009
[47] Campiche 2008 pg 4

Much in the spirit of the incentive program set up in Australia using a similar incentive program could be beneficial in building the individual benefits to a mandatory measles vaccination program. While a straight payment for vaccination raises many more ethical questions I believe implementing either a small reduction in daycare costs for those who vaccinate their children, or a small sanction on those who do not vaccinate their children would facilitate a more positive response from the public.

In respect to the publics opinion to a mandatory vaccination program it is also important to have an open line of communication as to not alienate individuals who would rebel over the fact of forcing medical interventions who would otherwise support the measles vaccination. In this regard it seems essential to maintain an exemption policy. While the exemption policy would allow for a certain part of the population to be unvaccinated it seems much more realistic to be able to establish a successful mandatory measles vaccination program with an exemption policy. The most common exemptions in vaccination programs are; medical, religious and philosophical. These would also be in place in a mandatory measles vaccination program, but more important than the types of exemption is how exemptions would be carried out. As stated previously about 80% of the population freely chooses to vaccinate without hesitation, 5% adamantly opposes vaccination for religious or philosophical reasons and 15% of the population is neither for nor against vaccination.[48] This means that the 5% of the population who strongly opposes measles vaccination will do whatever necessary to obtain an exemption where as the 15% of the population that can be persuaded either way could either vaccinate or obtain an exemption. It is important as a way to detract this population from choosing exemption to make the exemption process a difficult and time-consuming process. It should take more

[48] Seigrest 14.4.2009

time and effort to obtain an exemption than to vaccinate. This will help keep only those who truly do object on religious, philosophical or medical basis to seek exemptions.

Next Steps

My investigation into the Swiss health system and the prospect of having a successful mandatory measles vaccination program as a part of it was very limited to the French speaking part of Switzerland. Switzerland is not only decentralized in its government, but the country is also very different in its different sections. Before beginning any type of mandatory vaccination program, even if only in the French speaking cantons, a further study of a broader survey of the country would be essential. This is especially important in the German speaking cantons

Another perspective that I was not able to gain as much insight into as I wished to is that of the community and individual citizens. Having the viewpoint of the community when creating a policy for them is very important and definitely warrants further study. As with the other aspects of research, both in the geographic and medical senses, it is important to discuss with a variety of sub populations from a variety of backgrounds.

The final aspect that would need to be evaluated extensively before any type of policy could be truly recommended and then developed and implemented is the economic aspect. Though there is already research to support that the measles vaccine is cost effective[49], further research is needed specific to Switzerland and in a larger sense to assess the economic costs of not only providing the measles vaccine, but implementing the proper program support and education programs as well.

[49] "Weekly epidemiological record" 2004 pg 135

Conclusion

After conducting a comprehensive review of the Swiss health care system, both the contemporary and alternative medical perspectives on measles, and an evaluation of other countries response to measles and their vaccination programs I was able to make an educated evaluation of a mandatory measles vaccination program in Switzerland. Through this evaluation I was able to come to the conclusion that based on my research a mandatory program has a place in Switzerland. There were limitations to my study that warrant further investigation before moving forward with a mandatory program.

Through my research I was able to make very relevant progress in my learning. Primarily I was able to evaluate at a public health issue and then assess the health policy options for the public health issue that ended in a policy recommendation. As I hope to continue my education in health policy analysis and assessment this was a critical learning process to experience. Another important outcome of my research was my utilization of primary resources and emerging myself into the health care community of Geneva and Vaud. Not only did my utilization of primary resources increase my knowledge of my topic in a way that library research could never supplement, but it also boosted my confidence in discussing my knowledge and ideas with others.

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