ICASH-KEYNOTE

SCIENCE FOR MANKIND: TRANSLATING RESEARCH RESULTS INTO POLICY AND PRACTICES

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EXTENDED ABSTRACT

"The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."

A large proportion of people worldwide suffer ill health and have poor quality of life because of conditions that could be prevented. Translating research results into policy and practices is one way countries can make a difference and improve the health of their populations. Some of this is achieved through rules and legislation, some by introducing new approaches often involving technology, and some through education - this process is broadly known as health promotion.

Health promotion is defined by WHO [1] as a 'process to enable people to increase control over, and to improve their health'. When this approach was introduced about 30 years ago it built on new types of health programmes that moved beyond a focus on identifying individual risk behaviour in order to "make the healthy choice the easier choice" through a wide range of environmental and social interventions. Health Promotion – World Health Organization *https://www.who.int/healthpromotion/conferences/6gchp/en/index.html*

Five key principles guide health promotion strategies [1]:

1. Health promotion is context driven:
   Focuses on health and its underlying social and economic determinants for analyzing socio-economic, gender and ethnic gaps in health and disease patterns in populations.
2. Health promotion integrates the three dimensions of the WHO health definition:
   Promoting health means addressing the multi-dimensional nature of health: its physical, social, and mental dimensions (and often, spiritual health).
3. Health promotion underpins the overall responsibility of the state in promoting health:
   All levels of government have a responsibility and accountability for protecting, maintaining and improving the health of its citizens, and need to include health as a major component.
4. Health promotion champions good health as a public good:
   Good health is beneficial to the society as a whole, its social and its economic development.
5. Participation is a core principle in promoting health:

> The participation of people and their communities in improving and controlling the conditions for health is a core principle in promoting health.

The importance of health promotion for the region, and health policies related to it, is emphasized by two global conferences which have taken place in:

- Jakarta, Indonesia 1997. "New partners for a new era - leading health promotion into the 21st Century."
- Bangkok, Thailand 2005, "6th Global Conference on Health Promotion.

In terms of the theme of our conference – Translating research into policy and practices – WHO's principles 3-5 are particularly relevant to what we do as individuals and as members of a health care team or institute of higher learning.

While the state has the overall responsibility for the health of its citizens, and does this principally through policies and health programs, we all also have a responsibility to do our part and contribute through the work we do to health promotion. All levels of government are subject to national and regional policies intended to bring social and economic benefits through improvements in health. But we can help by being mindful of these policies, and by working to improve the health of the members of society we come into contact with. We can do this by helping those we work with and members of the public to understand what the policies mean, why they are relevant, and how each of us as individuals can make changes so that the beneficial outcomes the policies are intended to generate can be achieved.

Most of us here at this conference can see ways that we can champion good health as a part of the work we do already, or are studying to do. But as good health is a benefit for the individual and for society as a whole, we can and should all go further. What do you do to promote health among your friends or family? How do you share new knowledge you learn with your parents? What do you do when you see your brothers or sisters making choices and adopting behaviors in their lives which you know are either contrary to government policies, or potentially harmful to their health based on evidence-based information you have access to? Most importantly, how do those of you who are already parents yourselves promote the present and future health of your children through what you teach them and encourage them to do?

Participation across society is essential for effective health promotion. So we need to engage those we know and those we work with, and look for opportunities to reach out where we can to sections of the community that are new to us. In addition to using strategies that directly promote health around a specific issue, we also need to spread the word in the community about what the process of health promotion involves, why it is useful, how it can be done, and of course to explain the benefits.

As a pediatrician, a children's doctor, I always remind everyone that our children are not only important to us as parents and to members of our family, they are also our nation's most valuable resource. Healthy children are more likely to become heathy adults. We know that being a healthy as a child gives an individual a better chance of regularly attending school and completing their education, and that being healthy as an adult equates with greater ability to be productive and so economically better off. [3].

As examples of how and why the WHO principles of health promotion are applied, we can look at immunization against infectious diseases.

Health promotion is context driven

The current measles epidemic in the USA has prompted direct action in that country and made other countries look at infectious diseases in the context of their health promotion activities, and policies that need to be implemented.

The overall responsibility of the state is to promote health

Within the USA the state has shown its responsibility by putting legislation in place that requires all parents of school age children in affected communities to either produce proof of immunization against measles, or to keep their children home from school. In one state, unimmunized adults were ordered to get immunized within 48 hours or face fines, as the situation was classified as a 'state of emergency'. As an example of why a state of emergency was legitimate and confirmation of just how infectious measles is, one adult from an area where there was an outbreak travelled to a neighbouring state and is thought to have infected 41 people. This is also an example of how vulnerable people are to infection in a community that has low 'herd immunity.'

Health promotion champions good health and benefits everyone in society

Herd immunity is a community-wide effect that promotes health in society as a whole through health promotion focussed on immunization. Herd immunity against infection exists where the majority (>85%) of the population is immune to an infectious disease [4]. What this herd effect does is disrupt the natural progression of infection from an infected person to someone vulnerable to the disease, which stops or slows the spread of infection. In a practical sense good health for everyone in society (the herd) results, because of the high measure of protection provided for those individuals who are not immune by the fact that so many individuals do not become infected in an outbreak because they are immune, which means that overall the risk of infection is very small. Herd immunity can be achieved by natural infection or through immunization programs, and is the evidence-based scientific rationale for government policies that promote routine immunization of infants and children.

Health promotion integrates the physical, social, and mental dimensions of health

How many of you have had measles and are naturally immune as a result? How many of you have been immunized against measles? As a young doctor in England before the measles, mumps rubella vaccine (MMR) became available I saw many cases of measles, but since I have been in Canada, I have never seen a case because of immunization. My children were immunized when they were young, and now they are parents they have never seen how serious a measles outbreak can be. Going back to the situation in the USA, it is important for us to understand that, like my gown up children, parents there today are from a generation which has had almost no first-hand experience of the ravages that childhood infectious diseases can cause. This also applies to many parents in Europe but is probably a surprise to many of you in other countries.

Most doctors dealing with the highest rates of measles infection to occur in the USA in decades, have also never actually seen a case. In fact, measles was declared eliminated from that country in 2000, largely because of the success of national policies to achieve 'herd immunity' through immunization with the MMR vaccine [5].

The clinical presentation and diagnosis of measles is predictable and straightforward, but certain individuals are more vulnerable and at risk off complications, several of which can be serious [2].

When measles was common, most children experienced a miserable few days of illness but then recovered. When complications occurred, ear infections (otitis media) and croup (laryngotracheobronchitis) were most common. Pneumonia due to the measles virus itself and a secondary bacterial infection was much more serious and the main reason a child would die [5]. When brain inflammation (encephalitis) developed, this serious complication often caused brain damage and one form could develop many years after the original infection especially in children who became infected at a young age.

Children who are malnourished, especially those who are Vitamin A deficient, and older adults who are not immune are at particularly risk of infection; blindness may occur in these children and complications involving diarrhea and/or pneumonia can be fatal.

Other groups who are more likely to have severe infection and be at higher risk of complications include the following [2].

1. Infants and children < 5 years of age.
2. The elderly
3. Pregnant women.
4. Patients with compromised immune function.

It is important to diagnose cases of measles as soon as possible so that the infected child can be isolated from contact with others to minimize the risk of infection spreading. Diagnosis is based on the medical history and findings on examination of the patient.
The history will tell you if the child is immune based of a history of previous infection or prior immunization, and if there has been exposure to someone with known infection.
The clinical features of measles are usually obvious and the evolution of infection follows a predictable course.

The incubation period from the time of exposure to infection to the onset of symptoms is 8-12 days. The first signs of infection (the prodromal period) are fever, cough, runny nose and irritated watery eyes (coryza and conjunctivitis). Fever increases over 2-4 days, and can be as high as 40 °C as high; the child is usually miserable, appears ill, and complains that the light hurts their eyes (photophobia). The most characteristic (and diagnostic) feature of measles develops during this period – shiny spots that look like white grains of salt surrounded by a bight red ring seen in the mouth on the inside of the cheek (buccal mucosa) often close to the upper molar teeth - these are called Koplik spots [7]. (Dr. Koplik was an American pediatrician who described the spots in the 1890's); importantly Dr Koplik recognized these spots were characteristic of measles infection, and also noticed that they faded before the skin rash of measles develops. So, as well as their significance as away of diagnosing measles, Koplik spots also help us to control outbreaks. This is because at the time when we see them the disease has not reached its most infectious phase, so we can isolate the child and reduce the risk of others becoming infected [8]. However, patients are progressively more infectious from when their prodromal symptoms begin, until they become no longer contagious 48 hours after the rash appears.

The skin rash is red often with raised areas (maculopapular); it usually begins on the head, becomes confluent over the face and then spreads downwards to involve the chest and back and then the extremities over the next 3 days. When it fades it does so in the same head-to-toe equence. In patients with dark skin

the rash is not so easy to see, but remember the Koplik's spots are just as obvious in a dark-skinned child as in anyone else, and the child's parents will have noticed the rash.

Variations on this typical presentation include:

1. Longer, higher or recurrent fever where a bacterial infection (e.g. ear infection or pneumonia) develops as a complication
2. The characteristic rash may not develop or be modified in patients who have a compromised immune system (e.g. children on immune-suppressants or with leukaemia or HIV)

Natural infection or two doses of MMR vaccine provides protection that is usually life-long. Two doses of vaccine are 97%-98% effective; one dose is 90%-93% effective. When doing health checks on children ask to see vaccine records to make sure two doses of vaccine were given; this is good evidence of immunity.

Two doses of MMR vaccine administered after 12 months of age are required for full protection, but children can get the second dose as early as 28 days after the first dose, so it's not necessary to wait until children are 4-5 years of age.

Health promotion requires the participation of people and their communities to improve and control conditions for health

We can all participate in health promotion regarding preventable infectious diseases by learning to recognize the signs and symptoms of infection, and how to prevent infection through quarantine and immunization. We all have a responsibility to improve the health of the society we live by promoting knowledge, attitudes and action that achieve this.

As health care providers, educators, parents and as ordinary members of society we can share information and give advice. Information and advice can be shared in many ways, including when we deliver well-child preventive care, or are involved in campaigns to promote awareness of the need for and benefits of immunization. The primary aim of promoting health in this context is to increase the number of children in our community who are protected against common childhood infectious diseases.

There is a large body of literature which shows that immunization programs are the most effective way to prevent infectious diseases on a broad scale. Since immunization has become available countless children's lives and massive amounts of money have been saved by preventing diseases like polio, diphtheria tetanus and smallpox [9,10], and measles immunization is estimated by WHO to have saved more than 20 million lives since the year 2000 alone. The global relevance of promotion of vaccination is also emphasized by the central place of immunization in the policies of the World Health Organization, and the fact that agencies such as the Gates Foundation consistently list advances in the formulation and availability of agents used to protect children among their top funding priorities.

But as we all know, rates of child immunization are falling worldwide, leading to a rise in the number of individuals vulnerable to infection, which in turn increases morbidity and mortality from measles and the other diseases usually controlled by vaccinations. So, to participate effectively in health promotion we all need to understand the reasons for this. But as young people you are particularly well placed to find creative solutions for this problem that can be applied in the communities you live in. The kind of projects you have come to ICASH to report tell me that from the research you do and things you are interested in that in come

cases solutions you find and evaluate could lead to policies that governments come to use. Remember that the best official policies are based on evidence-based practices identified through well conducted research.

As discussed in a recent editorial in the Global Health Management Journal (which I hope you all read and will consider submitting articles on your research to) people in many countries have important cultural and religious beliefs that influence their decisions about immunization [11]. You are better placed than anybody to understand these, and to bring your social and cultural maturity into the equation to help work through these issues and help people become positive about immunization.

In Canada where I come from and our neighbour the USA parents' main reasons for resisting immunization range from fear of possible dangers from vaccines to ambivalence about the need to immunize their children [12]. It is easy to have negative feelings towards such parents, particularly when the evidence for benefit is so overwhelming and for those of us that have seen infectious diseases the need is so compelling. But we must always remember that whatever concerns a parent expresses, it is the underlying belief that they must protect their children from harm that drives their decision making.

We also need to recognize that in spite of the amazing benefits of immunization, vaccines are not perfect. Like every drug, every medical intervention, that has a benefit also they carry a risk of harm. For this reason, 19 countries worldwide have compensation plans for vaccine injuries, an approach based on the legal principle of reciprocity [13]. Citizens are urged (and I some case must because of government policies) to comply and get their children immunized for the greater good of the community (Yes, that 'her immunity' argument again). So, in the rare instances when an individual child is harmed, he or she should be compensated by the society they live in.
But consider the numbers. Such payouts do not prove vaccines are unsafe; since 2006 more that 3.2 billion doses of vaccines have been given in the USA. IN that period, the US vaccine injury compensation program received 6,293 claims, for reasons that ranged from fainting to brain injury, 4,311 were compensated. In 70% of cases there was no evidence to support that the harm claimed to have happened was caused by a vaccine, but claimants are (rightly) given the benefit of the doubt anyway. In short, the rate of injury for illness attributable to vaccines is one in 4.5 million. We would have difficulty finding a less dangerous medical act [13]

Another big issue globally is that mis-information about vaccines and immunization is a growing problem, largely because more and more parents choose to rely on their own research conducted through social media, where, as we all know, the information available ranges from excellent to wrong, with much in between that can be confusing, or in the worst cases is deliberately misleading. A 2015 survey in Canada on attitudes toward vaccines indicated more than one in four Canadians are hesitant or misinformed about vaccines [14]. This is a clear lesson that we all need to be part of the promotion of preventive health when it comes to immunization, and in particular must take every opportunity to provide parents who do not know the benefits with the facts they need and answers to questions they need answered.

So, having looked at health promotion from the standpoint of preventing infectious diseases how can we act to help translate research into policies and healthy practices?
A framework for future action can be viewed through the following dimensions [1]:

1. Working to achieve healthy public policies
   Our ministries of health have a special responsibility to make, administer and promote public policies. But we must ensure that the necessary research is done to provide the evidence base for

such policies to be informed and relevant, and that there is communication and engagement across the different sectors of government and the administrative agencies tasked with implementing them

2. Being partners and actors for health promotion
   We must see our role and responsibility in health promotion and not leave this important role to others, and must work with all the available sectors of society to improve the health of the communities we live in - the communities themselves, our policymakers, the private commercial sector, our academic and research community, civic groups and committed non-government organizations (NGO's).
3. Exploring new mechanisms and infrastructures for health promotion
   Various kinds of mechanisms and infrastructure and traditional pathways have proved useful and for health promotion. But you are the next generation in the field and will bring new ideas and strategies forward that will change the discipline and generate change for the better. Just think of how you could harness social media to promote health, and how unexpected partners like celebrities and their music videos can generate for good for society [15]. And remember that you also need to find ways to be the reasoned voice against the many ways that unhealthy products and lifestyles are marketed in your community.

In summary: Your new ideas, and the innovative ways you create to communicate will be a powerful way to promote health and enhance health literacy, and that society needs you to collaborate to do research and translate the results into policies and practices.

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