Integrative Pediatrics Patient Population
Children Cared For Since Neonatal Period
Births 01Jun2008 – 01Feb2019
Temporal Association Between Vaccines and Development

- 3,345 Patients Born Into Integrative Pediatrics Practice
- 10 Developed Autism Spectrum Disorder (ASD)
- 7 Had No Family History of ASD
    1. One Received No Vaccines
    2. Six Received Vaccines Prior to ASD Diagnosis (None after D
- Higher Number of Vaccines is Associated with Development of AS

- ASD Rate for Unvaccinated: 1 / 715
- ASD Rate for Vaccinated: 1 / 440

7 Patients Diagnosed With Autism Without FH		Population of Patients At Same Age (Days) Without Diagnosis of Autism		
Age (Days) Autism Dx'd	Number of Vaccines	Number of Patients (N)	Mean Vaccines at Same Age	Standard Error
589	16	2970	9.9	0.12
1045	0	2626	11.9	0.14
1065	20	2609	12.0	0.15
1238	14	2469	12.9	0.16
1516	16	2207	14.1	0.18
2778	19	1013	17.4	0.34
2785	28	1003	17.4	0.34

PHYSICIANS FOR INFORMED CONSENT

February 25, 2019

RE: HB 3063; Removes ability of parent to decline required immunizations on behalf of child for reason other than child's indicated medical diagnosis.

Position: Oppose

Dear Members of the Oregon House of Representatives,

On both ethical and scientific grounds, and on behalf of our Oregonian members, we at Physicians for Informed Consent (PIC) oppose House Bill 3063, as it is medically coercive, not evidence-based, and a danger to public health.

PIC is a nationally recognized 501(c)(3) nonprofit organization representing hundreds of doctors, as well as scientists and attorneys, whose mission is to safeguard informed consent in vaccination. In addition, our Coalition for Informed Consent consists of more than 100 U.S. and international organizations, including members from the state of Oregon.

Because recent measles outbreaks may be putting pressure on the Oregon state legislature to remove its constituents' rights to bodily integrity and informed consent, as a physicians' organization, we'd like to provide you with key information about measles and the measles-containing vaccine (MMR) so that you feel more confident in opposing the removal of vaccination exemptions to it.

Measles is a self-limiting viral infection that typically causes cough, runny nose, eye redness, fever, and a rash. In the pre-vaccine era, the risk of dying from measles in the U.S. was as low as one death per 10,000 measles cases, or 0.01%, and the risk of permanent disability from measles was even lower. Thus, 99.99% of children fully recovered from measles, even before the measles vaccine was ever introduced. See Figure 2 in the enclosed Measles Disease Information Statement (DIS) to compare the mortality of measles with today's leading causes of deaths in children under age 10, as well the Measles Vaccine Risk Statement (VRS) to learn the risks of the measles, mumps, and rubella (MMR) vaccine. Please carefully read these documents, as well as Dr. Alexander Langmuir's 1962 article "The Importance of Measles as a Public Health Problem" where he explained, "...in the United States measles is a disease whose importance is not to be measured by total days disability or number of deaths." Dr. Langmuir became director of the epidemiology branch of the Communicable Disease Center in 1949 and held the position for over 20 years.

In rare situations, such as vitamin A deficiency or a compromised immune system, measles can be severe and even deadly, if left untreated. In those situations, high-dose of vitamin A or measles immunoglobulin (passive immunization) are indicated to treat or prevent measles upon exposure, and therefore vaccination of other children is not necessary to save the lives of the immunocompromised. See enclosed Immunocompromised Schoolchildren - Risk Group Information Statement (RGIS). In general, however, nearly all children who are well nourished and have a healthy immune system can be expected to have a benign course of measles. For these reasons especially, it is important to

consider the frequency and severity of the MMR vaccine's side effects and to safeguard parents' responsibility to decide whether or not to vaccinate their children for measles.

In 2017, we reported in The British Medical Journal (The BMJ) that every year an estimated 5,700 U.S. children (approximately 1 in 640) suffer febrile seizures after the first dose of the MMR vaccine—which is five times more than the number of febrile seizures expected from measles itself. This amounts to 57,000 febrile seizures over the past 10 years due to the MMR vaccine alone. As 5% of children with a history of febrile seizures progress to epilepsy, a debilitating and life-threatening chronic condition, the estimated number of children whose epilepsy is due to the MMR vaccine in the past 10 years is 2,850. Thus, vaccine injury is a serious public health problem.

In addition, we found that the Vaccine Adverse Event Reporting System (VAERS) receives only about 90 annual reports of seizures following the first dose of MMR—that's only 1.6% of the 5,700 MMR-related seizures that occur each year. Thus, we contend that VAERS, being a passive surveillance system, does not adequately capture vaccine side effects and that serious side effects, including permanent neurological damage or death from MMR and other vaccines, may similarly be underreported. The enclosed Measles Vaccine Risk Statement (VRS) further explains that, to date, it has not been scientifically demonstrated that the MMR vaccine is safer than measles.

Furthermore, the National Childhood Vaccine Injury Act (NCVIA) of 1986 was created by Congress as a remedy to protect vaccine manufacturers from mounting vaccine injury lawsuits. Since then, the Vaccine Injury Compensation Program (VICP) it created has cumulatively awarded about $4 billion for severe vaccine injury cases or deaths—to only a small fraction of the VICP petitioners. Consequently, it is mostly families whose children have suffered uncompensated vaccine injuries and the doctors who care for them (including many of PIC's M.D. and D.O. members) who have a heightened awareness of the risks vaccines pose to the health of some American children and the diligence required to provide informed consent in an environment that is effectively immune from the tort system, civil litigation, and publicity.

In the United States, the right to bodily integrity is paramount. As sovereign individuals have the right to bodily integrity, they correspondingly have the right to decline any medical procedure, including vaccination, for themselves or their children—without undue discrimination, duress, or hardship. Denying access to education if a parent refuses a medical procedure for his or her child is a form of medical coercion that negates the medical ethics of informed consent.

We at Physicians for Informed Consent urge you to see the harm of mandatory vaccination laws to your constituents, and hope you oppose HB 3063 and any other bills that threaten the ability of parents to refuse the administration of a vaccine to their children.

Sincerely,

Shira Miller, M.D.
Founder and President
Physicians for Informed Consent

Enclosed: Measles Disease Information Statement (DIS), Vaccine Risk Statement (VRS), Immunocompromised Schoolchildren Risk Group Information Statement (RGIS) and "The importance of measles as a health problem"

MEASLES

What Parents Need to Know

PHYSICIANS FOR INFORMED CONSENT

Available in Spanish at / Disponible en español en physiciansforinformedconsent.org/measles

1. WHAT IS MEASLES?

Measles is a self-limiting childhood viral infection.

- Measles symptoms include a prodromal (initial) phase of cough, runny nose, eye irritation and fever, followed by a generalized rash on days 4–10 of the illness.[1]
- Measles is contagious during the prodromal phase and for 3-4 days after rash onset.[1]
- Most measles cases are benign and not reported to public health departments.[2]
- Before the measles mass vaccination program was introduced, nearly everyone contracted measles and obtained lifetime immunity by age 15.[1]
- In rare situations, measles can cause brain damage and death.[3,4]

Centers for Disease Control and Prevention (CDC) publishes measles case-fatality rates based on reported cases. However, nearly 90% of measles cases are benign and not reported to the CDC.[2] Calculating case-fatality rates based on reported cases (that constitute only 10% of all cases) results in a case-fatality rate that is 10 times higher than what it actually is in the general population. Data analysis herein is based on total measles cases (both reported and unreported).

2. WHAT ARE THE RISKS?

In the modern era, it is rare to suffer permanent disability or death from measles in the United States. Between 1900 and 1963, the mortality rate of measles dropped from 13.3 per 100,000 to 0.2 per 100,000 in the population, due to advancements in living conditions, nutrition, and health care—a 98% decline (Fig. 1).[2,5] Malnutrition, especially vitamin A deficiency, is a primary cause of about 90,000 measles deaths annually in underdeveloped nations.[6] In the U.S. and other developed countries, 75–92% of hospitalized measles cases are low in vitamin A.[7,8]

Research studies and national tracking of measles have documented the following:

- 1 in 10,000 or 0.01% of measles cases are fatal.[3]
- 3 to 3.5 in 10,000 or 0.03–0.035% of measles cases result in seizure.[9]
- 1 in 20,000 or 0.005% of measles cases result in measles encephalitis.[4]
- 1 in 80,000 or 0.00125% of cases result in permanent disability from measles encephalitis.[4]
- 7 in 1,000 or 0.7% of cases are hospitalized.[10]
- 6 to 22 in 1,000,000 or 0.0006–0.0022% of cases result in subacute sclerosing panencephalitis (SSPE).[11]

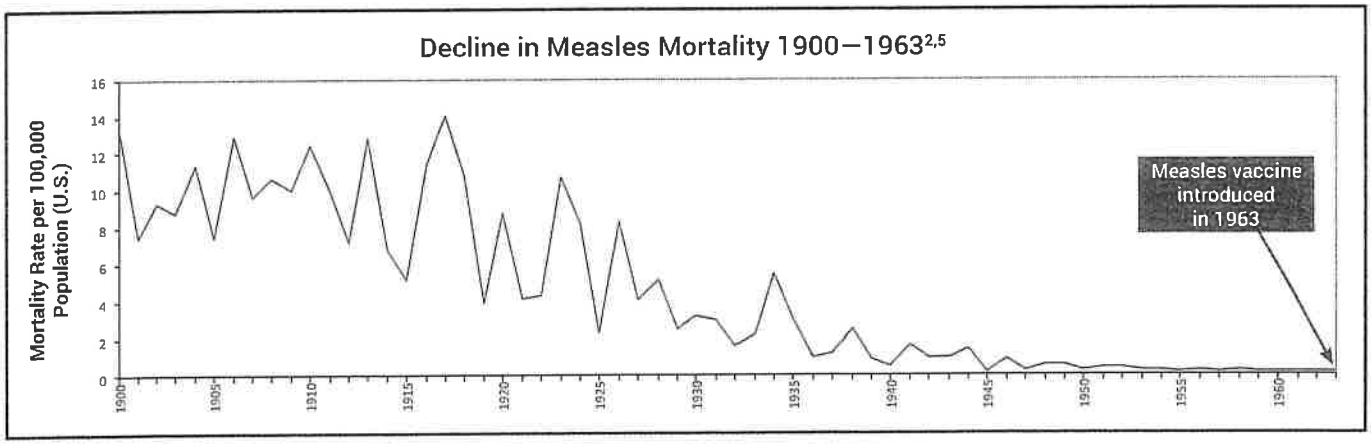

Figure 1: Measles death declined 98% from 1900 to 1963, before the measles vaccine was introduced.

3. WHAT TREATMENTS ARE AVAILABLE FOR MEASLES?

Because measles resolves on its own in almost all cases, usually only supportive treatment is necessary. As such, treatment options include the following:

- Rest
- Hydration
- High-dose vitamin A[12]
- Immune globulin (available for immunocompromised patients, such as those on chemotherapy)[13]

Vitamin A

The World Health Organization (WHO) recommends that serious measles cases be treated with high-dose vitamin A, 50,000–200,000 IU, orally on two consecutive days.[13]

4. ARE THERE ANY BENEFITS FROM GETTING MEASLES?

There are studies that suggest a link between naturally acquired measles infection and a reduced risk of Hodgkin's and non-Hodgkin's lymphomas, as well as a reduced risk of atopic diseases such as hay fever, eczema and asthma.[14-18] In addition, measles infections are associated with a lower risk of mortality from cardiovascular disease in adulthood.[19] Moreover, infants born to mothers who have had naturally acquired measles are protected from measles via maternal immunity longer than infants born to vaccinated mothers.[20]

5. WHAT ABOUT THE VACCINE FOR MEASLES?

The measles vaccine was introduced in the U.S. in 1963 and is now only available as a component of the measles, mumps, and rubella (MMR) vaccine. It has significantly reduced the incidence of measles; however, the vaccine is not capable of preventing all cases of measles, as failures have been reported.[21] The manufacturer's package insert contains information about vaccine ingredients, adverse reactions, and vaccine evaluations. For example, "M-M-R II vaccine has not been evaluated for carcinogenic or mutagenic potential, or potential to impair fertility."[11] Furthermore, the risk of permanent injury and death from the MMR vaccine has not been proven to be less than that of measles (Fig. 2).[22, 23]

Measles Mortality vs. Leading Causes of Death in Children Under Age 10 (per 100,000 Population)[22-25]

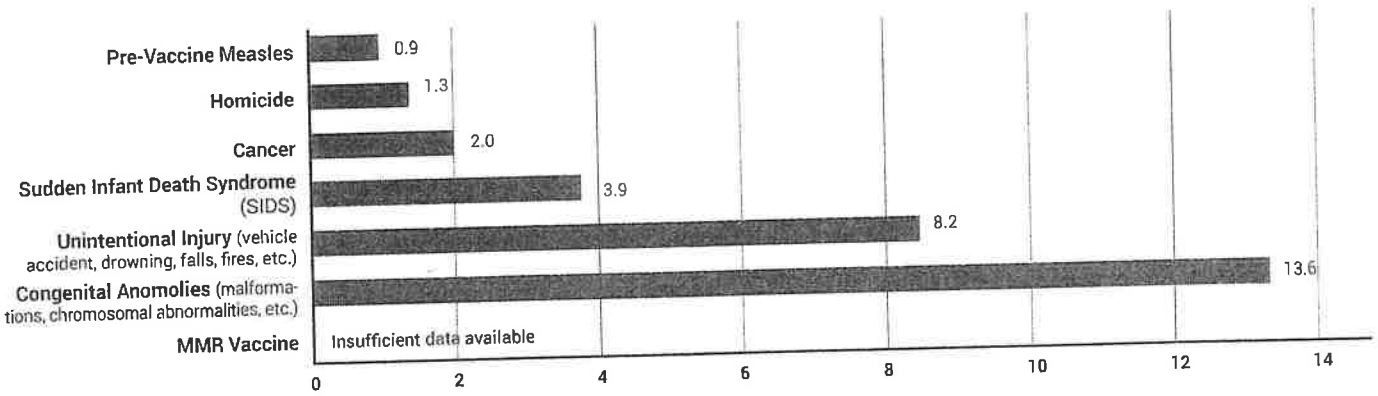

Figure 2: This graph shows the measles death rate before the vaccine was introduced, when measles was a common childhood viral infection, and compares it to the leading causes of death in children under age 10 today. Hence, in the pre-vaccine era, the measles death rate per 100,000 was 0.9 for children under age 10. In 2015, the death rate per 100,000 for homicide was 1.3, followed by cancer (2.0), SIDS (3.9), unintentional injury (8.2), and congenital anomalies (13.6). The rate of death or permanent injury from the MMR vaccine is unknown because the research studies available are not able to measure it with sufficient accuracy.[22, 23]

All references and the Measles Vaccine Risk Statement (VRS) are available at physiciansforinformedconsent.org/measles.

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   - Same sources as reference 2.
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MMR VACCINE (Measles, Mumps, and Rubella)

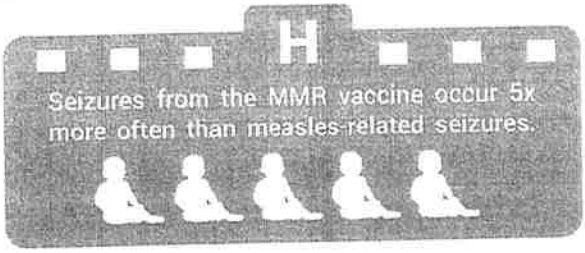
Is It Safer Than Measles?

PHYSICIANS FOR INFORMED CONSENT

Available in Spanish at / Disponible en español en physiciansforinformedconsent.org/measles

1. WHAT ARE SIDE EFFECTS OF THE MMR VACCINE?

Common side effects of the MMR vaccine include fever, mild rash, and swelling of glands in the cheeks or neck.[1] A more serious side effect is seizure, which occurs in about 1 in 640 children vaccinated with MMR[2]—about five times more often than seizure from measles infection.[3]



The Centers for Disease Control and Prevention (CDC) states that serious allergic reactions to the vaccine occur in about one in a million doses.[1] However, other severe side effects include deafness, long-term seizures, coma, lowered consciousness, permanent brain damage, and death.[1] While the CDC states that these side effects are rare, the precise numbers are unknown.[1] Additionally, the manufacturer's package insert states, "M-M-R II vaccine has not been evaluated for carcinogenic or mutagenic potential, or potential to impair fertility."[4]

2. HOW ARE RISKS OF VACCINE SIDE EFFECTS MEASURED?

Methods to measure vaccine risks include surveillance systems, clinical studies, and epidemiological studies.

3. HOW ACCURATE IS SURVEILLANCE OF ADVERSE EVENTS FROM THE MMR VACCINE?

The government tracks reported cases of vaccine side effects through the Vaccine Adverse Event Reporting System (VAERS). Approximately 40 cases of death and permanent injury from the MMR vaccine are reported to VAERS annually.[5] However, VAERS is a passive reporting system—authorities do not actively search for cases and do not actively remind doctors and the public to report cases. These limitations can lead to significant underreporting.[6] The CDC states, "VAERS receives reports for only a small fraction of actual adverse events."[7] Indeed, as few as 1% of serious side effects from medical products are reported to passive surveillance systems,[8] and as few as 1.6% of MMR-related seizures are reported to VAERS.[9] In addition, VAERS reports are not proof that a side effect occurred, as the system is not designed to thoroughly investigate all cases.[10] As a result, VAERS does not provide an accurate count of MMR vaccine side effects.

4. HOW ACCURATE ARE CLINICAL TRIALS OF THE MMR VACCINE?

The CDC states, "Prelicensure trials are relatively small—usually limited to a few thousand subjects—and usually last no longer than a few years. Prelicensure trials usually do not have the ability to detect rare adverse events or adverse events with delayed onset."[6] Since measles is fatal in about 1 in 10,000 cases and results in permanent injury in about 1 in 80,000 cases,[3] a few thousand subjects in clinical trials are not enough to prove that the MMR vaccine causes less death and permanent injury than measles (Fig. 1). In addition, the lack of adequate clinical trials of the MMR vaccine resulted in the manufacturer's package insert data to be reliant on passive surveillance for rates of MMR-related neurological adverse reactions, permanent disability, and death.[4]

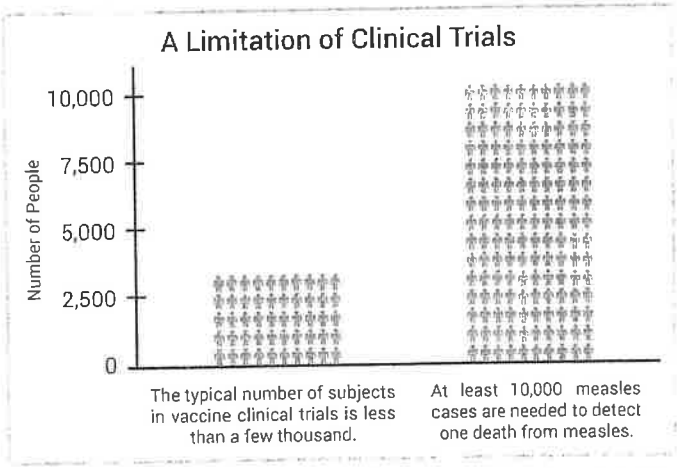


Figure 1: There are not enough subjects in clinical trials to prove that the MMR vaccine poses less risk than measles.

5. HOW ACCURATE ARE EPIDEMIOLOGICAL STUDIES OF THE MMR VACCINE?

Epidemiological studies are hindered by the effects of chance and possible confounders—additional factors that could conceivably affect the groups being studied. For example, there is a well-known 2002 Danish study published in the *New England Journal of Medicine* involving about 537,000 children that looked for an association between the MMR vaccine and certain adverse events.[11] The raw data in the study was adjusted, in an attempt to account for potential confounders, and the study found no association between the MMR vaccine and the adverse events. However, because there is no evidence that the estimated confounders used to adjust the raw data were actually confounders, the study did not rule out the possibility that the MMR vaccine increases the risk of an adverse event that leads to permanent injury by up to 77%. Consequently, the study did not rule out the possibility that such adverse events might occur up to four times more often than death from measles: 1 in 2,400 compared to 1 in 10,000 (Fig. 2 and Table 1). The range of possibilities found in the study, between the adjusted data and the raw data, makes the result inconclusive; even large epidemiological studies are not accurate enough to prove that the MMR vaccine causes less death or permanent injury than measles.

6. IS THE MMR VACCINE SAFER THAN MEASLES?

It has not been proven that the MMR vaccine is safer than measles. The vaccine package insert raises questions about safety testing for cancer, genetic mutations, and impaired fertility. Although VAERS tracks some adverse events, it is too inaccurate to measure against the risk of measles. Clinical trials do not have the ability to detect less common adverse reactions, and epidemiological studies are limited by the effects of chance and possible confounders. Safety studies of the MMR vaccine are particularly lacking in statistical power. A review of more than 60 MMR vaccine studies conducted for the Cochrane Library states, "The design and reporting of safety outcomes in MMR vaccine studies, both pre- and post-marketing, are largely inadequate."[12] Because permanent sequalae (aftereffects) from measles, especially in individuals with normal levels of vitamin A, are so rare,[3] the level of accuracy of the research studies available is insufficient to prove that the vaccine causes less death or permanent injury than measles.

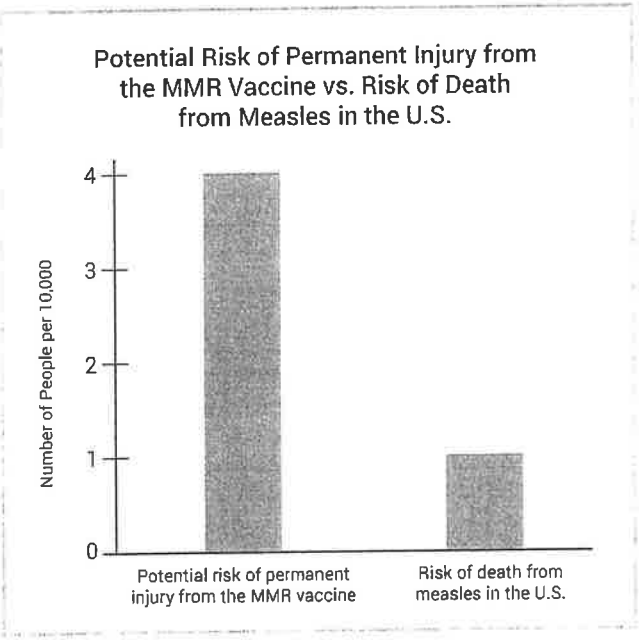


Figure 2: A 2002 Danish study did not rule out the possibility that the MMR vaccine can cause an adverse event leading to permanent injury four times more often than measles can be fatal.

Table 1: Statistical Analysis of an Epidemiological Study with Over Half a Million Children

RR = Relative risk
(risk in group vaccinated with MMR) ÷
(risk in group not vaccinated with MMR)

CI = Confidence interval
(possible range of RR due to effects of chance)

Adjusted RR reported in study
= 0.92 (95% CI, 0.68 to 1.24)

Unaltered RR recorded in study
(263/1,647,504) ÷ (53/482,360)
= 1.45 (95% CI, 1.21 to 1.77)

Potential RR = 1.77
(potential 77% greater risk than unvaccinated group risk)

Unvaccinated group risk recorded in study
= 53 in 97,000

77% of 53 in 97,000
= 1 in 2,400 additional risk in group vaccinated with MMR

All references and the Measles Disease Information Statement (DIS) are available at physiciansforinformedconsent.org/measles

These statements are intended for informational purposes only and should not be construed as personal medical advice.

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Vaccines: What About Immunocompromised Schoolchildren?

PHYSICIANS FOR INFORMED CONSENT

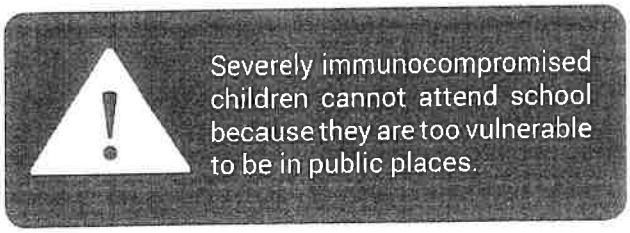
Available in Spanish at / Disponible en español en physiciansforinformedconsent.org/immunocompromised-schoolchildren

1. WHAT DOES IT MEAN TO BE IMMUNOCOMPROMISED?

Immunocompromised children have weakened immune systems that prevent them from optimally fighting infections on their own. Consequently, they may be at increased risk of complications from infectious diseases and require additional precautions and treatments.

2. CAN IMMUNOCOMPROMISED CHILDREN ATTEND SCHOOL?

Severely immunocompromised children are too vulnerable to be in public places and cannot attend school. However, children who are not severely immunocompromised can attend school with the approval of their doctor.



3. CAN IMMUNOCOMPROMISED SCHOOLCHILDREN BE VACCINATED?

Immunocompromised schoolchildren have the option to receive all the vaccines licensed for children in the United States, except for the live virus vaccines (such as vaccines targeting measles, mumps, rubella, or varicella infections).[1] Although vaccination often results in protective levels of antibodies in immunocompromised children,[2-6] clinical vaccine safety trials typically exclude immunocompromised subjects.[7] In addition, vaccines have not been evaluated for their potential to cause cancer, genetic mutations or impaired fertility in the general or immunocompromised population.[8] Due to these limitations, it is not known whether the benefit of vaccinating an immunocompromised child outweighs the risk of vaccine injury to that child.

4. DOES THE VACCINATION STATUS OF OTHER SCHOOLCHILDREN POSE A SIGNIFICANT RISK TO IMMUNOCOMPROMISED SCHOOLCHILDREN?

The vaccination status of other schoolchildren does not pose a significant risk to immunocompromised schoolchildren for the following reasons (Table 1):

- Some vaccines cannot prevent the spread of the bacteria or viruses they target.
- Not all infectious diseases are contagious.
- Some infectious diseases are not spread in schools.
- Some infectious diseases rarely cause complications in immunocompromised schoolchildren.
- Immune globulin (plasma containing antibodies) is available for immunocompromised children exposed to certain infectious diseases.

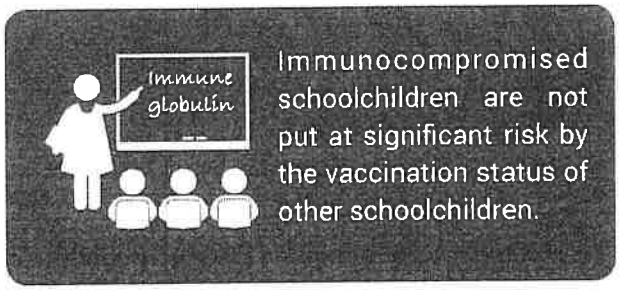
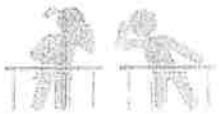


Table 1: Why the Vaccination Status of Other Schoolchildren Is Not a Significant Risk to Immunocompromised Schoolchildren



Some vaccines cannot prevent the spread of the bacteria or viruses they target.

Children vaccinated with the diphtheria, tetanus, and pertussis (whooping cough) vaccine (DTaP) or the inactivated polio vaccine (IPV) can still be infected with diphtheria-causing bacteria, pertussis bacteria, or poliovirus and spread them to others, even with mild or no symptoms of their own.[9-11] The influenza vaccines (TIV and LAIV) have not been observed to significantly reduce the spread of influenza.[12,13]

Not all infectious diseases are contagious.

Tetanus is not a communicable disease; that is, it cannot spread from person to person under any circumstances.[14]

Some infectious diseases are not spread in schools.

Hepatitis B is not spread by kissing, hugging, holding hands, coughing, sneezing, or sharing eating utensils,[15] and the main routes of hepatitis B transmission (sexual contact, injection drug use, or being born to an infected mother)[16] do not occur in school. Human papillomavirus (HPV) is sexually transmitted and is therefore not spread in school.[17] *Haemophilus influenzae* type b (Hib) is spread among children younger than school age, mostly of ages 3 and younger.[18]

Some infectious diseases rarely cause complications in immunocompromised schoolchildren.

Fatal cases of mumps are very rare in schoolchildren (1 mumps death per 100,000 mumps cases),[19] and immunocompromised children have been observed to recover just as well from mumps as the general population.[20] The greatest risks of pertussis and rubella are to infants and unborn babies, and being immunocompromised has not been observed to be a significant risk factor for complications of pertussis or rubella in schoolchildren.[21]

Immune globulin (plasma containing antibodies) is available for immunocompromised children exposed to certain infectious diseases.

Immune globulin (IG) is available for the prevention of severe symptoms in immunocompromised children exposed to measles or rubella (IG does not provide protection for fetuses of expectant mothers infected with rubella).[22,23] Varicella-zoster immune globulin (VIG) is available for the prevention of severe symptoms in immunocompromised children exposed to varicella (chickenpox).[24] Hepatitis B immune globulin (HBIG) and tetanus immune globulin (TIG) are also available for immunocompromised children.[1]

All references are available at physiciansforinformedconsent.org/immunocompromised-schoolchildren.

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THE IMPORTANCE OF MEASLES AS A HEALTH PROBLEM

Alexander D. Langmuir, M.D., F.A.P.H.A.; Donald A. Henderson, M.D., F.A.P.H.A.; Robert E. Serfling, Ph.D., F.A.P.H.A.; and Ida L. Sherman, M.S.

DURING the past 40 years the ecological approach to disease has become a basic concept of epidemiology. Among all diseases measles has stood as the classic example of successful parasitism. This self-limiting infection of short duration, moderate severity, and low fatality has maintained a remarkably stable biological balance over the centuries. Those epidemiologists, and there are many, who tend to revere the biological balance have long argued that the ecological equilibrium of measles is solidly based, that it cannot readily be disrupted and that therefore we must learn to live with this parasite rather than hope to eradicate it. This speaker, not so long ago, was counted among this group and waxed eloquent on this subject in print.[1]

Happily, this era is ending. New and potent tools that promise effective control of measles are at hand. If properly developed and wisely used, it should be possible to disrupt the biological balance of measles. Its eradication from large continental land masses such as North America and many other parts of the world can be anticipated soon.

The importance of any disease as a public health problem must be gauged from many angles. For example, using mortality as a criterion heart disease becomes most important. Short-term morbidity makes the common cold rank high. For chronic disability arthritis and mental disease dominate. For public interest and parental concern, in spite of relatively low incidence, nothing has equaled poliomyelitis.

According to these criteria, the importance of measles cannot be compared with any of the diseases mentioned so far, but it should still be classed as an important health problem on two main counts. First, any parent who has seen his small child suffer even for a few days with persistent fever of 105°, with hacking cough and delirium wants to see this prevented, if it can be done safely. Second, at last there is promise that something can be accomplished by organized health action.

As a contribution to this symposium, we of the Communicable Disease Center have brought together some of the basic descriptive statistics concerning measles in the United States. We hope this may serve as a simple frame of reference broadly defining our problem.

Figure 1 presents annual morbidity and mortality for the expanding reporting areas from 1912 to 1959. Note the stability of the morbidity rate and the steady downward trend in the mortality rate. Also, there is the somewhat ominous suggestion of a cessation of this downward trend since 1955 similar to the leveling off of the infant death rates during the past six years. The morbidity figures testify to the stability of the biological balance of measles during the period. The decline in mortality demonstrates the degree to which we have adapted to this balance and have learned to live with this parasite.

Figure 2 presents the familiar curves of cumulative frequency of a history of measles by age. Two large studies published by Collins in 1929[2] and 1942[3] are compared with a recent survey conducted by Epidemic Intelligence Service

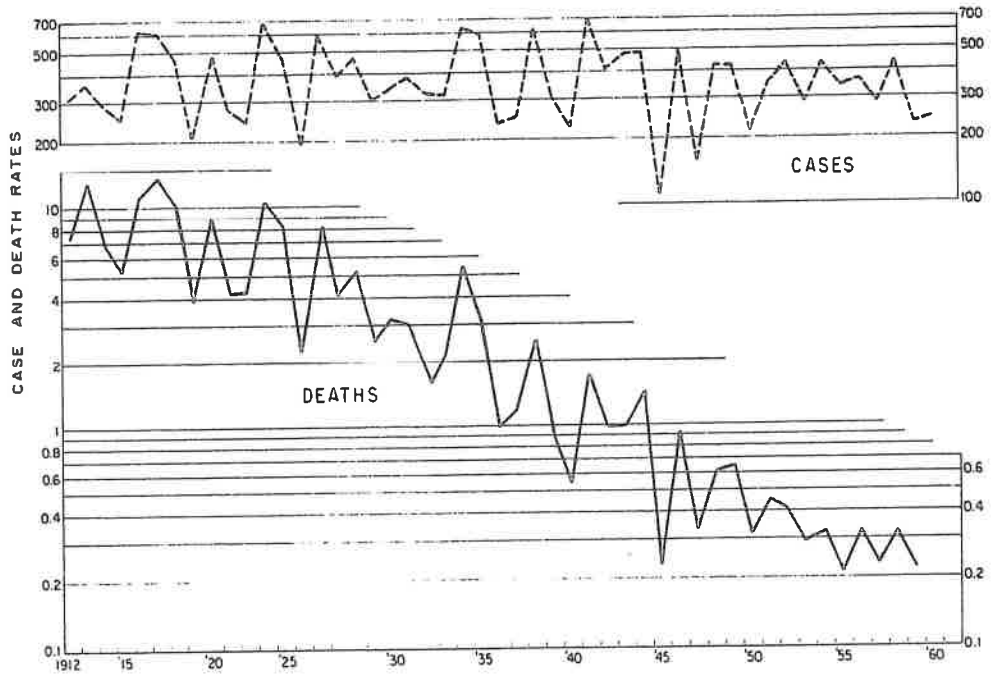

Figure 1—United States Measles Reported Cases and Deaths per 100,000 Population, 1912-1959

Officers in Atlanta in the summer of 1961.[5] Also shown is the curve of neutralizing antibodies for measles virus reported by Black from New Haven in 1959.[4] Note the great similarity of the curves and the high level of 90 per cent or greater reached by age 15 in all of the studies. More than 50 per cent give a history of measles by age six years.

These cumulative curves can be converted by relatively simple statistical procedures to estimate age-specific attack rates. These are shown for the Atlanta survey in the upper panel of Figure 3. These estimates are corrected for underreporting. Note that the peak incidence falls in the age group three to four years. This stands in sharp distinction to the six-year peak usually observed in age distributions of reported cases. Presumably case reporting for school children tends to be better than for preschoolers.

The central panel of Figure 3 shows age-specific mortality rates for measles for the three-year period 1957-1959, the latest available national statistics. The highest mortality occurred in the age group 6 to 11 months, after which it fell progressively, but significant numbers of deaths are still recorded in the three- to six-year age group where incidence of cases is highest.

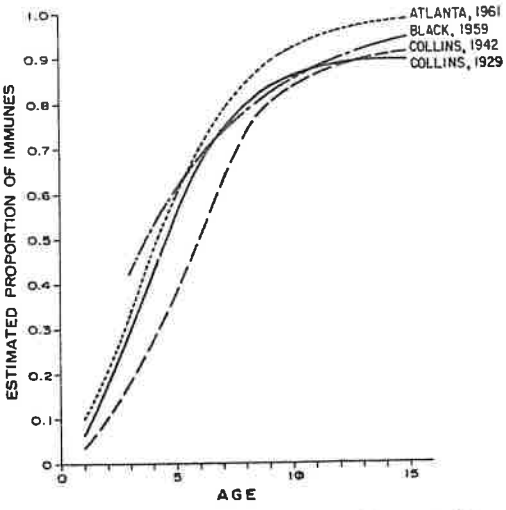

Figure 2—Estimated Proportion of Measles Immunes by Age, in Four Studies

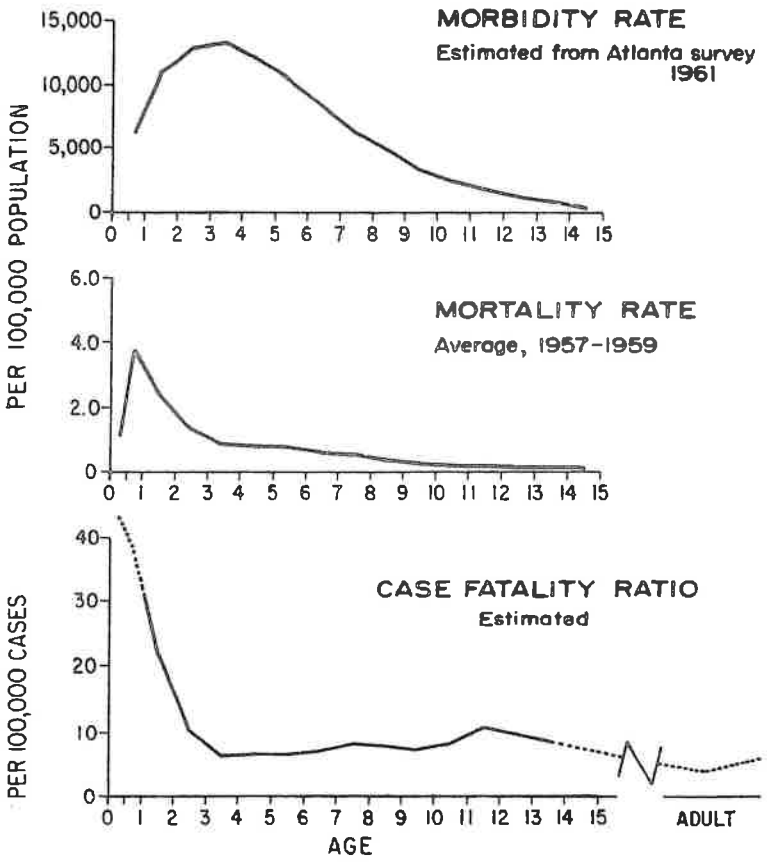

Figure 3—Measles Rates by Age

In the lower panel of Figure 3, the data in the upper two panels have been combined to provide approximate case fatality ratios. These cannot be separated for infants under six months and for those 6 to 11 months of age because the survey data do not permit estimates of the low incidence in early months of life. Clearly the greatest risk of death from measles exists during the first and second years of life. The slight but apparent rise in the ratio at age 11 years is probably an artifact in the morbidity estimate. There is, however, a small but finite mortality from measles among elderly persons revealing that even in this modern age of extensive communication some persons still may escape infection in childhood.

Thus, in the United States measles is a disease whose importance is not to be measured by total days disability or number of deaths, but rather by human values and by the fact that tools are becoming available which promise effective control and early eradication.

To those who ask me, "Why do you wish to eradicate measles?," I reply with the same answer that Hillary used when asked why he wished to climb Mt. Everest. He said, "Because it is there." To this may be added, ". . . and it can be done."

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January 2018

PERSONAL DATA

Citizenship: Canada, United States
Languages: American English (primary), Norwegian, Swedish, Danish (some Arabic, Kiswahili, multiple computer languages)

Currently Retired from Dalhousie University

RECENT POSITIONS

Director of Medical Informatics, Division of Medical Education
Dalhousie University Faculty of Medicine, Halifax, Nova Scotia

Assistant Professor, Pediatrics, Division of Neonatal Pediatrics Jointly Appointed in Computer Science Faculty
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Practicing Clinical Neonatologist
IWK Health Centre, Halifax, Nova Scotia

Assistant Professor, Faculty of Graduate Studies
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Senior Advisor for Health Affairs, Governments of Belize and St. Lucia
Appointed to Minister of Health

Member of Steering Committee, Ethiopian Medan Acts PMTCT Program

EDUCATION

1994-1997 Fellowship in Neonatology, University of South Florida, Department of Pediatrics, Division of Neonatology, Tampa General Hospital, Tampa, Florida.

1991-1994 Residency in Pediatrics, Dartmouth Medical Centre, Lebanon, New Hampshire.

1987-1991 Doctor of Medicine, University of Florida, College of Medicine, Gainesville, Florida. Graduating with Honors for Special Achievement.

1984-86. Master of Public Health, Major Emphasis in Health Policy and Health Management, Minor Emphasis in Epidemiology, College of Public Health, University of South Florida, Tampa, Florida. Thesis: Population Biology of Filariasis.

1981-84 Master of Science, Applied Statistics (Ecology and Applied Statistics), Rutgers, The State University of New Jersey, New Brunswick. Thesis: Population Structure in Egyptian Biomphalaria alexandrina.

1977-81 Bachelor of Science, Biology, Pacific Lutheran University, Tacoma, Washington. Magna Cum Laude.

LICENSURE

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Have Held Medical Licenses in Nova Scotia, Indiana, Arkansas, Florida

AWARDS

Professional:	Pacific Lutheran University Mission Award 2017 (Alumni) Nova Scotia Discovery Award Professional of Distinction 2013 Fellow, Royal Society for Public Health, UK (FRSPH) Fellow, American Academy of Pediatrics (FAAP) Delta Omega Public Health USA National Honor Society Listed in America's Top Pediatricians 2002, 2003, 2004
Graduate:	University of South Florida Graduate Council Fellowship, 1985-86 National Science Foundation Fellowship, 1981-84 Busch Memorial Fellowship, 1981-84
Undergraduate:	Arete Society (PLU equivalent to Phi Beta Kappa), 1981 Who's Who in American Colleges & Universities, 1981 Faculty Merit Scholarship, 1980-81 Undergraduate Biology Fellowship, 1980-81 International Youth in Achievement, 1981 National Deans List, 1979 Cheany Merit Scholarship, 1979-80

NATIONAL COMMITTEES

2012-2016 Editorial Board Paediatrics and Child Health, Canadian Paediatric Society

2005-2010 Canadian Perinatal Surveillance Committee, Public Health Agency of Canada

2004-2007 Steering Committee, Prevention of Mother to Child Transmission of HIV (PMTCT) National Program, Ministry of Health, Federal Republic of Ethiopia

PUBLICATIONS

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6.Vincer MJ, Cake H, Graven MA, Dodds L, McHugh S, Faboni T. A population-based study to determine the performance of the Cognitive Adaptive Test/Clinical Linguistic and Auditory Milestone Scale to Predict the Mental Developmental Index at 18 Months on the Bayley Scales of Infant Development-II in very preterm infants. Pediatrics 2005 Dec 116(6): E864-7.

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11. Graven MA. Decline in mortality with the Belize Integrated Patient-Centred Country Wide Health Information System (BHIS) with Embedded Program Management. IJMI 2013; 82: 954–963.

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5. Graven MA. Collection of Public Health Data with Limited Public Health Resources. AmFiTan (Joint America, Finland, Tanzania) Conference on Ethics in International Development, Dar es Salaam, Tanzania, February 6, 2000.

6. Graven MA. Ethical Use and Constraints in the Use of Identified Health Data for International Development Programs. AmFiTan (Joint America, Finland, Tanzania) Conference on Ethics in International Development, Tampa Florida, USA, February 18, 2001.

7.Graven MA. Ethical Judgment and the Use of Public Health Data: Stakeholder Disagreement in the Setting of International Development. AmFiTan (Joint America, Finland, Tanzania) Conference on Ethics in International Development, Helsinki Finland, August 15, 2002.

8. Sauve RS, Liu S, Graven MA, Kramer M, Joseph KS, Evans J, Allen A. Neonatal Readmissions for serious conditions not recognized at birth (Poster), Pediatric Academic Society Annual Meeting, San Francisco, California, May 2, 2006.

9. Sauve RS, Liu S, Graven MA, Kramer M, Joseph KS, Evans J, Allen A. Neonatal Readmissions for serious conditions not recognized at birth (Poster), Canadian Pediatric Society, St Johns, Newfoundland, June 15, 2006 (Abstract Number 50)

10. Graven MA, Ghebrehiwot H, Hagos S. Sustainability: Translation and use of African Languages for development and deployment of Health Informatics Initiatives in Ethiopia,

HELINA 2007: eHealth in Africa, Bamako, Mali, January 10, 2007

11. Graven MA. Informatics Issues in the Use of Neonatal Brain Monitoring, 3rd International Conference on Brain Monitoring and Neuroprotection, Vienna, Austria, January 16, 2008.

12. Graven MA and King, S. Age and Gender Distribution of Diabetes Incidence in St Lucia., 136th Annual Conference of the American Public Health Association, San Diego, October 25-29, 2008.

13. Graven MA and Allen P. Role of Country-Wide Health Information System in Decreasing the Intensity of Service Required to Manage Hypertension Among Belizeans 65 or Older., Public Health Informatics (PHIN) Conference, Atlanta Georgia, September 1, 2009.

14. Graven MA, Smith I, and Allen P. Implementing, national - one patient one record integrated comprehensive health information system in Belize. WHO Global Health Information Systems Forum, Prince Mahidol Award Conference, Bangkok Thailand, January 28, 2010.

15.Graven MA. Belize Health Information System (BHIS). IDRC Workshop on Enterprise Architecture in Health, June 3, 2010.

16. Graven MA, Smith I, and Allen P. The Belize Health Information System: Design, Deployment and Impact on Health Outcomes. AIDS2010, Vienna Austria, July 17, 2010.

17. Graven MA, MacDonald N and Allen P. Metazoan Infections in Belize Children 2008-2009 Diagnosed in the Outpatient Setting, Studied Using the Belize Health Information System (BHIS) Data. Academic Pediatric Societies Annual Meeting, May 1, 2011.

INVITED PRESENTATIONS (Partial List).

1. Graven MA. Invited presentation to Director of Maternal-Child Health Bureau, US Department of Health and Human Services. Washington, D.C. Study of Early Infant Discharge and Medical Consequences, February 1997.

2. Graven MA. Critical Issues in the Development of Public Health Information Systems First AMFITAN Conference: Ethics in International Development, Dar Es Salaam, February 2000.

3. Graven MA. Risks of Maldevelopment: Public Health Information Systems in Developing Countries Second AMFITAN Conference, Tampa, Florida, January 2001.

4. Graven MA and Allen P. Belize NHISS: Observations on Development and Early Analytical Uses. UWI Country-Wide Conference, Belize City, November, 2001.

5. Graven MA. Ethical Framework for Developing Public Health Information Systems in Developing Countries, Third AMFITAN Conference, Helsinki, August 2002.

6. Graven MA, Allen P., Rutter N. Equity and development of Health Information Systems. Second International Society for Equity in Health Conference, Durban South Africa June 2004.

7. Graven MA. Health Informatics Training in the Caribbean Basin. Belize Minister of Health Manpower Development Forum, Belmopan Belize Central America, December 2004.

8. Graven MA. Potential Uses of Province-Wide Health Information in New Brunswick. Memramcook Leaders Forum, Memramcook New Brunswick May 28 2005.

9. Graven, MA. Readmission Risks after Early Neonatal Discharge From Hospital. Canadian Public Health Agency, Ottawa, Ontario, Canada, July 28, 2005. Graven, MA.

10. Graven, MA (Hon. Keith Mondesir, St Lucia Minister of Health Delegation). Potential for Integrated Country-Wide Health Information Systems in the Caribbean. CARICOM Health Ministers Summit (COHSOD), July 14, 2008. Port of Spain, Trinidad.

11.Paterson G, Cameron S, Soroka S, Cheng C, Graven MA, Mensink N, Delva D and Brar R: Summer Institute in Health Informatics (SIHI): An Educational Initiative for Faculty Development in Medical Education. *ITCH 2009 Revolutionizing Healthcare with Informatics: From Research to Practice*. Victoria, BC. February 18-22, 2009.

12. Graven, MA and Allen, P. (Hon. Pablo Marin, Belize Minister of Health's Delegation). Model for Harmonization of Health Information Systems for the CARICOM Community. CARICOM Health Ministers Summit (COHSOD), February 4, 2010. Port of Spain, Trinidad.

13 Graven, MA. Belize Health Information System: An Example of "Getting It Right". IDRC invited workshop on Enterprise Architecture in health information systems, Vancouver, June 3, 2010.

14 Graven, MA. Integrated Patient-Centered Health Information Systems. International Pediatric Association Congress, Vancouver, August 19, 2016.

INTERNATIONAL PROJECTS RELATED TO HEALTH INFORMATICS

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Belize Health Information System (BHIS). Volunteer for the Ministry of Health in Belize since 1998 and ongoing. **Co-designer and Chief Architect of the BHIS**. Wrote some of the source code for the system. The BHIS has been recognized as best of its kind by the Gates Foundation- Vital Wave Consulting May 2009; identified by PAHO as the regional standard for country-wide health information systems for the Caribbean region in July 2009.

Developed all algorithms for the 8 areas of disease prevention and then embedded them into the BHIS. Results published in 2012 for MCH, and 2013 for all 8 disease management areas.

St Lucia Health Information System (SLU-HIS). Volunteer for the Ministry of Health in St Lucia since 2007 and ongoing. **Co-designer and Chief Architect of the SLU-HIS.** Served as volunteer support for the Ministry of Health for Diabetes and Hypertension Disease Management Program. Provided data entry and analytical support for review 32,000 records. The findings were reported in April 2007 and lead to a nation-wide St Lucia Disease Management program with the goal to achieve dramatic improvement in diabetes incidence and outcomes.

St Vincent and The Grenadines Health Information System (SVG-HIS). Volunteer for the Ministry of Health in St Vincent and The Grenadines since 2010 and ongoing. **Co-designer and Chief Architect of the SVG-HIS.**

South Africa. Health Information support for development and deployment of an integrated health information system with disease management protocols embedded initiative in KwaZulu Natal Province 2012-2014.

Ethiopia. Volunteer to Medan ACTS PMTCT Program since 2004- 2008; volunteer to Federal Ministry of Health from 2005-2008; two areas: PMTCT and Health Information Systems. Developed and wrote the code for the entire information system for PMTCT in all of Ethiopia. Through 2009, this program has prevented an estimated 22,000 HIV infections in babies born to HIV+ mothers (reduction in incidence from 45% to 12%). Also delivered large scale training in PMTCT services for healthcare professionals, data entry clerks and IT support staff 2005-2007. Developed a consortium of Ethiopian Universities (Addis Ababa U, Debub U, and Gondor U) for a PhD programs in Health Informatics that lead to 3 universities in Ethiopia offering a PhD program. As a member of the planning committee, wrote the first draft of the course curriculum. From 2005 onwards, have episodically taught lectures in Health Informatics at Addis Abba University.

INTERNATIONAL HEALTH CARE EXPERIENCE

Voluntary, unpaid public health work in 44 countries, mostly as informatics support for specific disease management programs.

Schistosomiasis Control Team Member, Qalyub Bilharziasis Program, Egypt, and Blue Nile Health Program, Gezira, Sudan, December 1979-May 1984. Served in a volunteer capacity during Undergratuate (PLU) and Graduate (Rutgers) education programs. Activities involved field work with collection of vector snails, including those infected with schistosomiasis, defining and evaluating human infection rates, designing multistage disease control programs. In Sudan, these activities were conducted under circumstances of very high personal risk.

Team Leader, Childhood Immunization Survey, Minnehaha County South Dakota Health Department, June 1976-August 1976. Activities included conducting door-to-door survey administration, planning and assigning survey grids to 5 other surveyors in the team, gathering completed survey forms, data entry, and analysis of survey results.

UNITED STATES HEALTH INFORMATICS EXPERIENCE (Partial List)

Information Services Department (DSS), Shands Hospital at the University of Florida, Gainesville, Lead Information Systems Analyst August 1986 to June 1991. Worked with all levels of administration, from unit managers to the Executive Staff and Hospital Governing Board in respect to health information. Activities included data acquisition, analysis, statistics and experimental design development, both financial and clinical audit, system development, and graphics production. Shands serves the entire state of Florida as the referral quaternary care centre and serves well over 78,000 patients admitted to hospital, 153,000 emergency room visits and in 929,000 outpatients per year.

Chief Information Officer and Chief Medical Officer at Phymatrix Consulting and Managed Care, Inc. (PCMC, Palm Beach Gardens, Florida) July 1998-June 1999. Under contract to University of Arkansas for Medical Sciences, Department of Pediatrics. Served as corporate officer with both CIO and CMO portfolios for Physician Network Management business unit (largest in Phymatrix Corporation). Managed nearly 4,000 physicians of all specialties for 10 million covered lives in 27 states for service contracts with all major health insurers in the US, including CIGNA, Prudential, etc. Activities included credentialing and discipline for providers, patient and provider satisfaction surveys, managing healthcare encounters of all types, processing payments for both fee-for-service and capitation to contracted physicians. Lead design and deployment of health information systems throughout 27 states for hospitals, clinics, and physician offices. Developed and ran disease management system for diabetes for ~500,000 type II diabetics, which resulted in reduced hospitalization and complication rates.

Analyst Hillsborough County Hospital Authority, Tampa Florida, Marketing and Public Relations Department January 1986-July 1986. Served all departments of Hillsborough County Hospital Authority, including Tampa General Hospital which is the largest hospital in the Tampa Bay area. Worked with all levels of administration, including multiple presentations to the Hospital Board of Directors. Lead multiple projects that gave rise to millions in cost savings for the hospital. Participated in several hundred successful contract negotiations with health insurers for defined services plans for health plans and HMO's.