PHYSICIANS FOR INFORMED CONSENT

February 25, 2019

Chairman Frank Pallone, Jr.
Committee on Energy and Commerce

Oversight & Investigations Subcommittee
Of the House Committee on Energy and Commerce

RE: Errors in Memorandum for the hearing on "Confronting a Growing Public Health Threat: Measles Outbreaks in the U.S." on February 27, 2019

Dear Chairman Pallone and Subcommittee Members,

In the introductory background section of the Memorandum[1] for the hearing on "Confronting a Growing Public Health Threat: Measles Outbreaks in the U.S.," it is written that "One or two deaths occur among every 1,000 children who acquire measles." This is a critical calculation error, which requires your urgent attention and correction.

The second paragraph in the background section contains evidence of the error. It explains that prior to the introduction of the measles vaccine in 1963, "there were an estimated 3 to 4 million people infected with measles in the United States, and as many as 500 related deaths each year," which is correct. However, this translates to a number of deaths which, at most, is one in 6,000 (3,000,000 divided by 500). More precisely, between 1959 and 1962, about 400 measles deaths occurred out of about 4,000,000 measles cases, which calculates to one death among every 10,000 children (0.01%) who acquire measles, not one in 500 or one in 1,000 as written in the introduction.

The reason this mistake unfortunately commonly occurs is because the Centers for Disease Control and Prevention (CDC) publishes case-fatality rates based on the number of *reported* cases only. And, since it is estimated that nearly 90% of measles cases are benign and therefore *not reported* to the CDC, the widely publicized measles case-fatality rate is a 10-fold miscalculation. Such an error has grave public health consequences.

Information available on total measles pre-vaccine cases (both reported and unreported to the CDC) in comparison with today's leading causes of death in children under age 10,[2] and the risks of the measles, mumps, and rubella (MMR) vaccine,[3] are enclosed. 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."[4] Dr. Langmuir became director of the epidemiology branch of the Communicable Disease Center in 1949 and held the position for over 20 years.

Another error in the Memorandum is in the prevention and response section where it is suggested that no treatments are available for measles. 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 vitamin A and immunoglobulin (passive immunization) are indicated to treat or prevent measles upon exposure, respectively.[2] In addition, there is evidence that the antiviral ribavirin is beneficial in the treatment of measles, and this requires further research.[5-7] Therefore, the vaccination of others is not necessary in order to protect immunocompromised persons from severe measles, or other infections,[8] and coercing such action would be highly unethical and unscientific.

Finally, the Memorandum states that "CDC has determined that receiving the MMR vaccine is safer than getting any of the viruses," however this has not been scientifically demonstrated. 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 from the first dose of the MMR vaccine—which is five times more than the number of febrile seizures expected from measles.[9] 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. In addition, we contend that the Vaccine Adverse Event Reporting System (VAERS), as a passive surveillance system, does not adequately capture vaccine side effects and that serious side effects, including permanent neurological harm and death from the MMR and other vaccines, may similarly be underreported.

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 who apply within the three-year or two-year statute of limitations, respectively. Consequently, it is mostly families whose children have suffered vaccine injuries and the doctors who care for them who have a heightened awareness of the risks vaccines pose to some American children, in an environment that is effectively immune from the tort system, civil litigation, and publicity.

We realize the errors discussed above are technical, but we urge you to take the time to discuss them thoroughly with your epidemiologists and statisticians, as ultimately the Memorandum should be retracted. We also appreciate what pressure you must be under to protect public health, and hope you do whatever it takes to guarantee that the decisions you make are based on accurate information. The right to bodily integrity, and the health, of millions of Americans is at stake.

We are here to assist you.

Sincerely,

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

1. Memorandum Re: Hearing on "Confronting a Growing Public Health Threat: Measles Outbreaks in the U.S., Feb. 22, 2019.
(https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/OI%20Briefing%20Memo_Hearing%20on%20Measles%20Outbreak_2019.02.27_final.pdf accessed Feb. 24, 2019)

2. Physicians for Informed Consent. Measles – Disease Information Statement (DIS). Sept 2018.
(https://www.physiciansforinformedconsent.org/measles/dis accessed Feb. 24, 2019)

3. Physicians for Informed Consent. Measles – Vaccine Risk Statement (VRS). Dec 2017.
(https://www.physiciansforinformedconsent.org/measles/vrs accessed Feb. 24, 2019)

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(https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1522578/ accessed Feb. 24, 2019)

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(https://www.ncbi.nlm.nih.gov/pubmed/23629813 accessed Feb. 24, 2019)

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8. Physicians for Informed Consent. Vaccines: What About Immunocompromised Schoolchildren? July 2018.
(https://www.physiciansforinformedconsent.org/immunocompromised-schoolchildren accessed Feb. 24, 2019)

9. Miller S. BMJ 359 (2017):j5104, Re: The unofficial vaccine educators: are CDC funded non-profits sufficiently independent?
(https://www.bmj.com/content/359/bmj.j5104/rr-13 accessed Feb. 24, 2019)

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

Physicians for Informed Consent 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.

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]

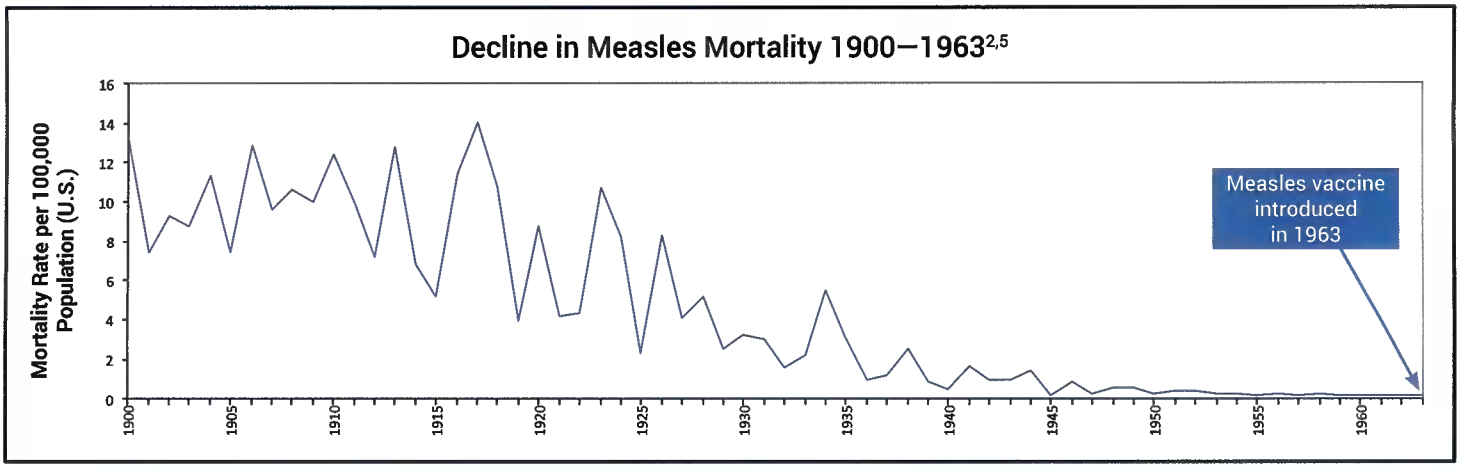

Figure 1: Measles death declined 98% from 1900 to 1963, before the measles vaccine was introduced.

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]

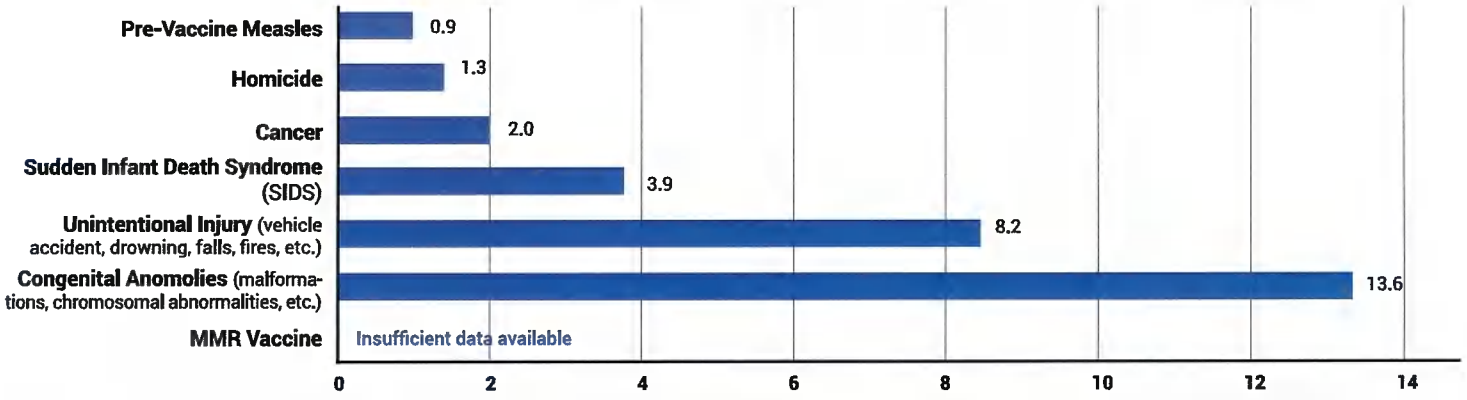

Figure 2: This graph shows the measles death rate before the vaccine was introduced, when measles was a common childhood viral infection, and compares it to the leading causes of death in children under age 10 today. Hence, in the pre-vaccine era, the measles death rate per 100,000 was 0.9 for children 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.

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

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    - Same sources as reference 3.
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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]

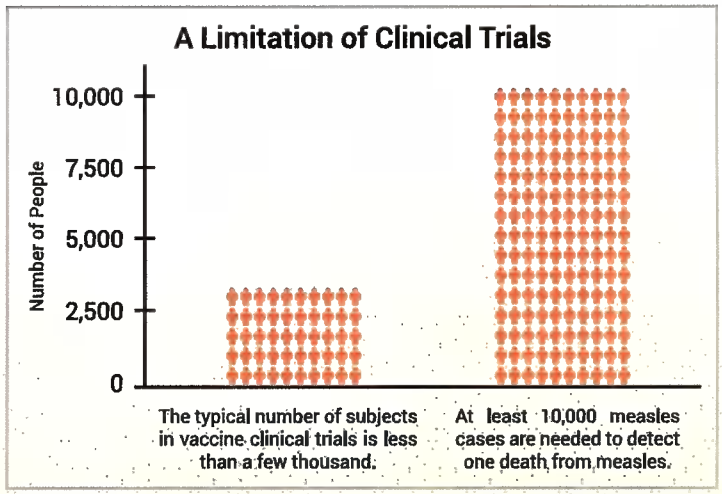

Figure 1: There are not enough subjects in clinical trials to prove that the MMR vaccine poses less risk than measles.

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.

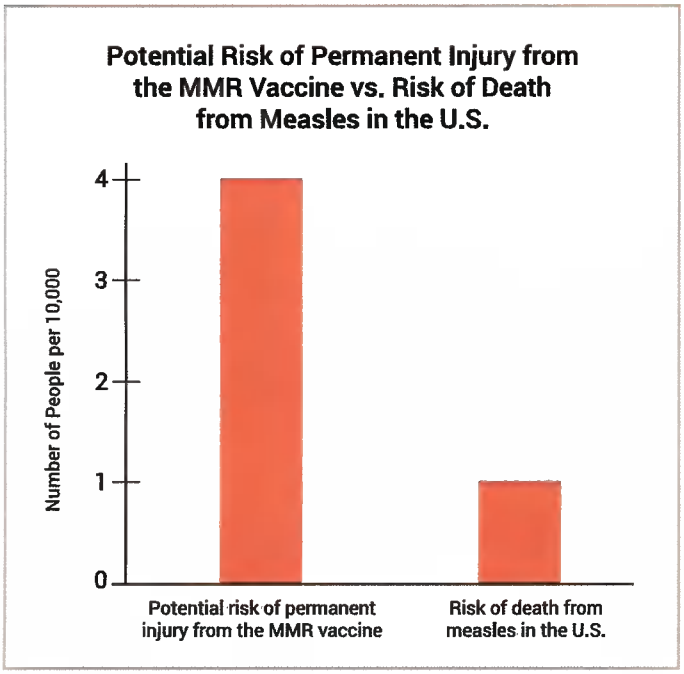

Figure 2: A 2002 Danish study did not rule out the possibility that the MMR vaccine can cause an adverse event leading to permanent injury four times more often than measles can be fatal.

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

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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.

Severely immunocompromised children cannot attend school because they are too vulnerable to be in public places.

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.

Immunocompromised schoolchildren are not put at significant risk by the vaccination status of other schoolchildren.

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

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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

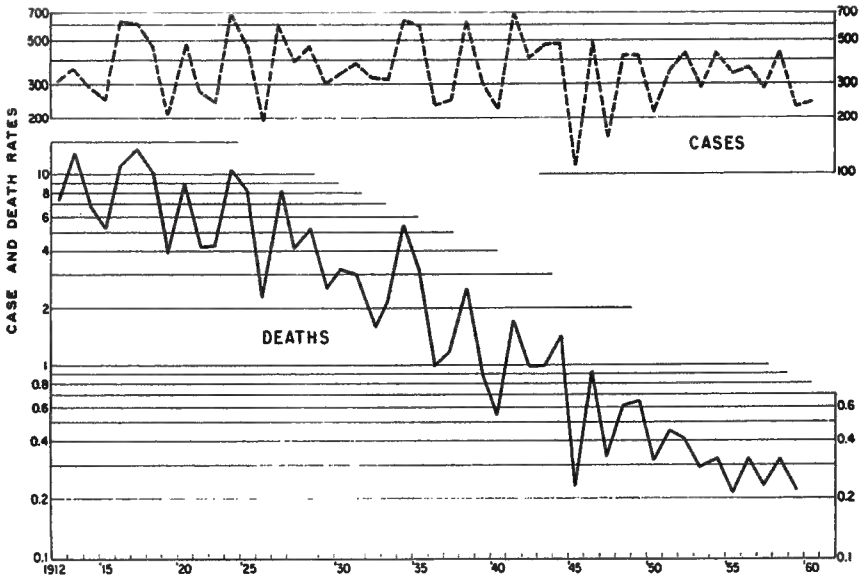

Figure 1—United States Measles Reported Cases and Deaths per 100,000 Population, 1912-1959

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.

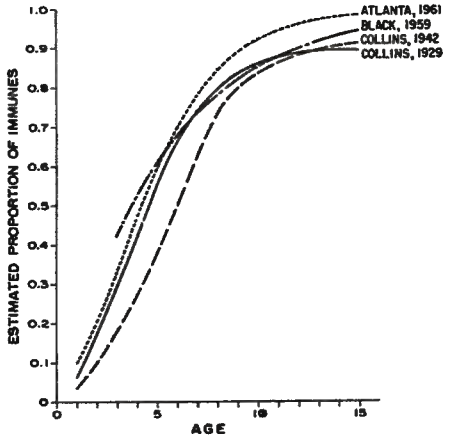

Figure 2—Estimated Proportion of Measles Immunes by Age, in Four Studies

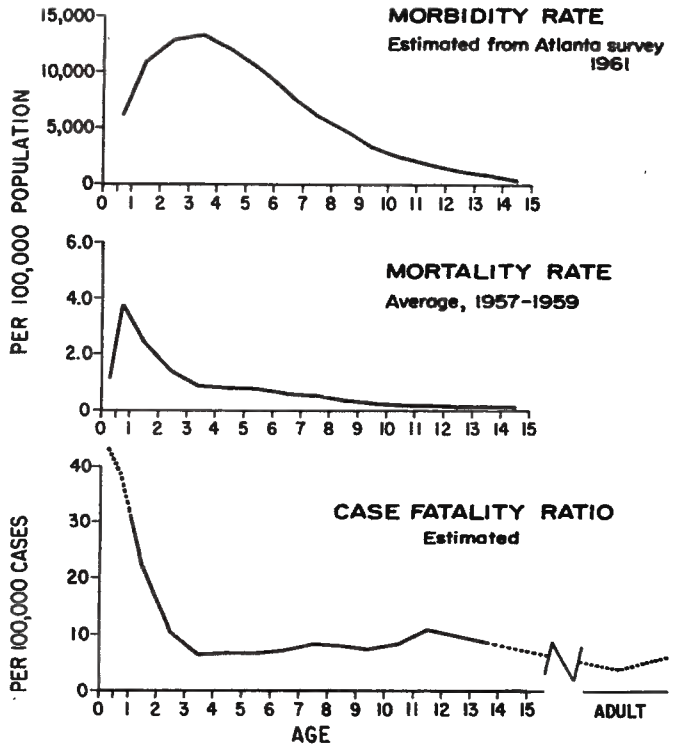

Figure 3—Measles Rates by Age

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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