

Module 3: What About Polio – Lesson 2

Confident Parents – Intelligent Leaders – Articulate Activists

Key points:

- **96%** of all polio infections were mild or asymptomatic
- Key dates:
 - 1979: After this date, only vaccine-associated paralytic polio (VAPP)
 - 1991: No further wild polio viruses identified
 - 1994: WHO certified Western Hemisphere polio-free
 - 2000: US stopped using OPV and was replaced by 5 IPV injections. OPV still used worldwide.
- **Eradication:** permanently reducing an infection or a disease **to zero** where intervention is no longer needed vs.
- **Extinction:** when a pathogen no longer exists in nature or in the laboratory
- Formed in 1988, The Global Eradication Initiative (GPEI) has used >\$15b to drive polio viruses to extinction.
- Refute the 10 Facts about polio eradication put forth by the WHO
- Polio is a mostly benign virus except in the presence of toxic metals and chemicals.

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Creating a New Disease

- **After 1955 – and the release of the vaccine:**
 - Signs and symptoms needed to diagnose polio:
 - Residual paralysis at 10-20 days **AND**
 - Residual paralysis at 50-70 days after first diagnosis

Creating a New Definition of an Epidemic

- **After 1955 – and the release of the vaccine:**
 - A polio epidemic was defined as 35 cases per 100,000

Key Dates:

- **After 1979:** Only cases of paralysis in the US from the oral polio vaccine. Called VAPP, Vaccine-Associated Paralytic Polio
 - The US stopped using the OPV in **2000**
 - OPV is still used in Worldwide polio vaccine campaigns
- **1991:** No cases of wild polio virus identified in the US
- **1994:** The WHO certified **Western Hemisphere** was certified as **polio free**
 - **REFERENCE:** Surgeon General David Satcher, MD. MMWR 1994; 43:720-2.

Polio Eradication: *Final Steps?*

- **Terminology:**
 - **Control:** reduction of an infection or a disease to a locally acceptable level with ongoing intervention necessary to maintain the reduction
 - **Elimination:** reducing an infection or a disease to zero in a defined geographical area with ongoing interventions necessary to maintain the reduction
 - **Eradication:** permanently reducing an infection or a disease **to zero** where intervention is no longer needed
 - **Extinction:** when a pathogen no longer exists in nature or in the laboratory
 - **REFERENCE:** Vashisht N, Puliye J. “Polio programme: let us declare victory and move on.” Indian J Med Ethics. 2012 Apr-Jun;9(2):114-7.

The WHO: 10 Facts on Polio Eradication

<http://www.who.int/features/factfiles/polio/en/>

<http://www.who.int/news-room/fact-sheets/detail/poliomyelitis>

Non-Fact #1: Polio causes irreversible paralysis in 1 in 200 infections; 5-10% have bulbar paralysis and die

- > *The Pink Book states <1% of infections result in paralysis*
- > *In 2012: only 223 confirmed cases of poliovirus*
- > *By 2017: only **FIVE** cases in the stool ***in the entire world.****

Non-Fact #2: More than 16M have been saved from paralysis due to vaccination records

- > *How do they know that? It's a mathematical model.*
- > *How many children are paralyzed by the OPV used in National Immunization Day Campaigns*

- **Oral Polio Vaccine**

- International Immunization Days (INDs) were designed to deliver as many as 430 million OPV doses over 7 days
- Estimated for every 1 million doses of the OPV, **two cases of VAPP (paralysis) are created** – either in the vaccinated child, or in a close contact. Therefore, each campaign could potentially leave behind 860 paralyzed children. There are no records; some children have received more than 20 doses.

Non-Fact #3: The remaining FIVE countries still reporting polio can spread to other countries without vaccination.

- > *Considering the poverty and war conditions in these countries, it is doubtful many will be traveling.*
- > *These countries certainly have more pressing needs than vaccination*

- **Global Polio Eradication Initiative**

- **1988:** Launched after the WHO passed a resolution to eradicate polio
- **2017:** The FIVE remaining countries in the world who report polio infections to the WHO:
 - Afghanistan
 - Democratic Republic of the Congo
 - Nigeria
 - Pakistan
 - Syrian Arab Republic
- Global partners: G7 countries, 45 non-G7 countries and a variety of Foundations and charities
- More than **\$15 billion** spent on eliminating a virus due to the **Principle of Eradicationism**
- **How the Surveillance Works**
 1. Finding children with AFP
 2. Collect and transport stool samples for analysis
 - Two samples, 24 to 28 hours apart
 - Must be collected within 48 hours of onset of paralysis
 3. Identifying the virus
 - Poliovirus vs non-polio virus
 - Poliovirus -> type 1 or 3 (type 2 absent since 1999)

4. Mapping the virus

Non-Fact #4: Polio can only be eradicated if 100% of the world is vaccinated.

- > Since polio ≠ paralysis, is **eradicationism** the best use of billions of dollars in some of the poorest locations in the world?
- > The most important point that is missing: eliminating polio **will not eliminate acute flaccid paralysis**

• **Acute flaccid paralysis**

- The WHO polio surveillance system is based on scanning for acute flaccid paralysis (AFP).
 - **Acute flaccid paralysis (AFP):** Episode from weakness to paralysis occurs in less than 4 days. The affected limb(s) are flaccid, (i.e. floppy or limp) as opposed to rigid or stiff.
- There are over 100 serotypes of human enteroviruses, which cause a spectrum of illnesses, **including AFP**
 - Coxsackie A viruses
 - Coxsackie B viruses
 - Echoviruses
 - 5 other Enteroviruses, including EV68 and EV71
 - **REFERENCE:** “Pons-Salort, Margarita, et al. “The epidemiology of non-polio enteroviruses: recent advances and outstanding questions.” Current Opinion in Infectious Diseases: October 2015 - Volume 28 - Issue 5 - p 479–487

Non-Polio Acute Flaccid Paralysis (NP-AFP)

- **2011:** India declared “polio free”
- **2012:** Vashish and Puliyeel, pediatricians in Delhi, India, published a study that found:
 - NP-AFP is “clinically indistinguishable” from paralysis associated with the wild polio virus
 - NP-AFP had **twice the risk of dying** as wild polio virus
 - 60 days after diagnosis: 35.2% with NP-AFP had **residual paralysis** and 8.5% had died
- The incidence of NP-AFP **directly proportional** to the number of oral polio doses received
 - **REFERENCE:** Vashisht N, Puliyeel J. “Polio programme: let us declare victory and move on.” Indian J Med Ethics. 2012 Apr-Jun;9(2):114-7.

“What is the value of the WHO’s *polio-free certification* when nearly 50,000 children experience and/or die from non-polio acute flaccid paralysis **every year?**” Dr. Vidya Krishnan, pediatrician, March 28, 2016
The Hindu <http://www.thehindu.com>

• **Why NP-AFP?**

- Pesticide production started in India in 1952. Today, India is second largest manufacturer of pesticides in Asia after China and ranked twelfth globally
- **2009:** DDT residues were found in ~82% of the 2205 samples of bovine milk collected from 12 states and 186 samples of 20 commercial brands of infant formula
 - The average total DDT and BHC consumed by an adult were 19.24 ppm/d and 77.15 ppm/d respectively
 - The Maximum Residue Level of DDT in whole milk is 0.05 mg/kg (0.05ppm)

- **REFERENCE:** Wasim Aktar, et al. "Impact of pesticides use in agriculture: their benefits and hazards." *Interdiscip Toxicol.* 2009 Mar; 2(1): 1–12. Published online March, 2009. PMID: PMC2984095
 - **REFERENCE:** Negi, RK, Rani, Shakti. "Contamination profile of DDT and HCH in packaged milk samples collected from Haridwar, India." *Intl. J. Pure App. Biosci.* 3 (5): 121-127 (2015)
- **Polio is a mostly benign virus except in the presence of toxic metals and chemicals.** We should be focusing on the elimination of DDT, glyphosate and other arsenic/lead containing pesticides and chemicals instead of spending billions and being obsessed with a few cases of paralysis that may not even be caused by the poliovirus.

Non-Fact #5: Cheap and effective oral polio vaccine can prevent polio for US\$0.14 per dose
> That "cheap vaccine" can cause a lifetime of tragedy by causing VAPP – vaccine associated paralytic polio

Non-Fact #6: The global effort to eradicate polio is the largest public-private partnership in public health
> It is a travesty that billions of dollars, human-power and effort has not gone to improve food, water, housing, education, electricity and safety stopping violence. The worst travesty? All this effort will not eradicate paralysis.

Non-Fact #7: Large-scale vaccination efforts have occurred. In India, 191 million homes were visited and 172 million children were dosed with OPV prior to eradication.
*> Do the math: 2 potentially paralyzed for every 1M.
 > More than 6 OPV doses per year, they are at greater risk for NP-AFP.*

Non-Fact #8: EVERY child must be vaccinated to achieve eradication, even those in the most remote areas of the planet.
> How would you refute this? The answer seems pretty obvious by now, right?

Non-Fact #9: Polio-funded staff, transportation lines and resources are also used for other health initiatives.
*> The supply routes have been used to smuggle arms, drugs and people.
 > Where there is no enforcement, the crimes go unchecked.*

Non-Fact #10: We can eradicate polio.
> At what cost? Many billions have already been spent.

*How could those resources have been better utilized if it was understood that polio is not a synonym for paralysis **and** public health had not embraced eradicationism.*

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