Passing of the TORCH: A Medical, Historical, and Social Comparison between Rubella and Zika

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Rubella was first described in the 1750s but took until 1941 when Congenital Rubella Syndrome was characterized to become medically significant. Similarly, Zika virus was discovered in 1947 but only made headlines in 2016 when its infection during pregnancy was associated with fetal microcephaly. Interestingly, despite zika being primarily a disease of the developing world and rubella historically being a worldwide disease, zika was found to have been studied and controlled at a much faster rate than rubella – particularly in the United States (U.S.). This correlation is further highlighted by the fact that there are currently no therapies or vaccines available for zika. A review of Thomas McKeown’s work, the McKeown Thesis, provides insight into the U.S.’s successful zika control. The Thesis posits that broad-based social efforts at the population level are more significant at affecting public health than narrow-based medical interventions at the individual level. The swift control of zika despite the lack of specific therapeutics and vaccines suggests the McKeown Thesis’s applications. This presentation will reflect on the progress and history of medicine within the past century and demonstrate the need for continued vigilance within the medical community.

**ABSTRACT**

Rubella was first described in the 1750s but took until 1941 when Congenital Rubella Syndrome was characterized to become medically significant. Similarly, Zika virus was discovered in 1947 but only made headlines in 2016 when its infection during pregnancy was associated with fetal microcephaly. Interestingly, despite zika being primarily a disease of the developing world and rubella historically being a worldwide disease, zika was found to have been studied and controlled at a much faster rate than rubella – particularly in the United States (U.S.). This correlation is further highlighted by the fact that there are currently no therapies or vaccines available for zika. A review of Thomas McKeown’s work, the McKeown Thesis, provides insight into the U.S.’s successful zika control. The Thesis posits that broad-based social efforts at the population level are more significant at affecting public health than narrow-based medical interventions at the individual level. The swift control of zika despite the lack of specific therapeutics and vaccines suggests the McKeown Thesis’s applications. This presentation will reflect on the progress and history of medicine within the past century and demonstrate the need for continued vigilance within the medical community.

**Key References**


**Rubella & Zika**

- **Togavirus**: spherical, enveloped, (+) ssRNA
- **Strictly human disease with no known animal reservoir**
- Transmission via contact with contagious droplets or transplacental from mother to fetus
- Mild, generally harmless disease in children and adults, but potential for Congenital Rubella Syndrome (CRS) in fetuses resulting in congenital defects
- Congenital defects commonly include cataracts, sensorineural deafness, cardiac abnormalities, and microcephaly
- Risk of maternal-fetal transmission and risk of fetal malformations dependent on week of gestation and gestational age
- Risk of fetal infection is 80-90% in the first 12 weeks, 5% at 13-14 weeks, and 25% by the end of the second trimester; risk increases again toward the end of pregnancy
- Risk of fetal malformations is 85-100% in the first 8-12 weeks, 50% from 13-16 weeks, 25% during late second trimester, and rare after 20 weeks of gestation
- Risk of fetal malformations is 85-100% in the first 8-12 weeks, 5% in the second, and 4% in the third trimester.

**CONCLUSIONS**

- McKeown Thesis: Are public health goals better achieved by narrow interventions at the individual level, or by broad measures to redistribute social, political, and economic resources that can then influence health at the population level?
- While vaccines and medications are vital in the management of disease, larger, overarching public health initiatives that effect an entire population should not be overlooked. Further emphasis needs to be placed on public health initiatives in the future to prevent a situation like Zika – outreach, screening, and social marketing.