IMMUNISATION REFUSAL: IMPACT TO THE FUTURE

Dr Aminah Bee Mohd Kassim, Public Health Physician
Family Health Development Division
History of Vaccination

- 9th century - Muhammad Ibn Zakariyya al-Razi – 1st person to describe in details of smallpox and measles (The Book on Smallpox and Measles)

- 1549 - First clear reference to smallpox inoculation - by the Chinese author Wan Quan in his book Douzhen xinfa

- 16th century second half - Inoculation for smallpox became widespread in China during the Ming Dynasty

- 17th century latter half - variolation was also practiced in Turkey, Persia, and Africa

- 1716-1718, Lady Mary Wortley Montagu discovered the Ottoman Empire concept of variolation during her stay in Istanbul and brought the idea back to Britain

- 1796 – Edward Jenner tested his theory by inoculating a boy with material from cowpox blisters

- 1798 – smallpox vaccine was introduced
• Eradication of smallpox
• Elimination of poliomyelitis with exception in 3 countries
• Global reduction of measles mortality by 74% (from year 2000 to 2013) and incidence, 21% (from 2010 to 2015)
• Improvements in routine immunisation coverage
Vaccine Doubts & Skepticism? Nothing New!

“Clever” Sceptics

Ignorant & Fearful
Vaccinology: the past

Edward Jenner
Anti-vaccination Movement 18th century

The Arguments

- **Religious**: “diseases are sent by God to punish sin”, “one should die a “natural death” and not change the course of natural events

- **Safety**: the procedure of scoring the flesh on a child’s arm, fear of contracting the disease or dying from the vaccine

- **Violating personal liberties**

Sermon against Inoculation (1722)
Anti-vaccination Movement 18th century

Anti Vaccination Society/League

• The Anti Vaccination League and the Anti-Compulsory Vaccination League formed in response to the mandatory laws (Vaccination act 1853 and 1867) in England

• The Leicester Demonstration March of 1885 was one of the most notorious anti-vaccination demonstrations

• US: the Anti Vaccination Society of America was founded in 1879, following a visit to America by leading British anti-vaccinationist William Tebb.
Anti-Vax Movement Today

Religious

Conspiracy Theories

Pharma - money making

Natural Alternative

Age of Autism

Adverse Effects

Anti-Vax Movement Today

Harmful

Link to Autism
Anti-Vax On The ‘Net

• The Internet also provides a bigger platform and louder voice than was possible a 100 years ago

• opportunity for anti-vaccination activists to diffuse their messages to a much wider audience and recruit new members

• Internet permits a faster and larger diffusion of anti-vaccination content, has contributed to the increase of vaccine hesitancy and refusal among parents
My child, my choice!
“Vaccines can only improve health and prevent deaths if they are used, and immunization programmes must be able to achieve and sustain high vaccine uptake rates. Vaccine hesitancy is an increasingly important issue for country immunization programmes”

Dr Philippe Duclos, Senior Health Adviser for WHO’s Immunization, Vaccines and Biological Department
NHMS 2016
95.3% received complete primary immunisation
• 86.4% could be verified using records kept by family.
• 8.9% self-reported
VPD incidences and deaths in Malaysia

Diphteria

Year 2014 2015 2016
Death 0 1 5

Measles

Year 2014 2015 2016
Death 1 2 5

Pertussis

Year 2014 2015 2016
Death 1 13 2
Good coverage but outbreaks occur

- National estimates of vaccination coverage do not reflect variability within a country.
- Under vaccinated individuals tend to cluster together, leading to increased transmission of VPD
Vaccine refusal, 2013 - 2016

<table>
<thead>
<tr>
<th>Year</th>
<th>No.</th>
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<tbody>
<tr>
<td>2013</td>
<td>637</td>
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<tr>
<td>2014</td>
<td>918</td>
</tr>
<tr>
<td>2015</td>
<td>1541</td>
</tr>
<tr>
<td>2016</td>
<td>1603</td>
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Reasons for refusal

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<tr>
<td>Hemopathy</td>
<td>118</td>
<td>271</td>
<td>529</td>
<td>215</td>
</tr>
<tr>
<td>Doubt Halal Haram</td>
<td>12</td>
<td>13</td>
<td>36</td>
<td>217</td>
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<tr>
<td>Internet Influences</td>
<td>232</td>
<td>54</td>
<td>124</td>
<td>157</td>
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<tr>
<td>Doubt with Vaccine Contents</td>
<td>105</td>
<td>42</td>
<td>267</td>
<td>410</td>
</tr>
<tr>
<td>Family Influences</td>
<td>29</td>
<td>47</td>
<td>73</td>
<td>99</td>
</tr>
<tr>
<td>Fear of Adverse Events</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>41</td>
</tr>
<tr>
<td>FIACT (for Foreigner)</td>
<td>56</td>
<td>92</td>
<td>92</td>
<td>81</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>54</td>
<td>47</td>
<td>190</td>
</tr>
<tr>
<td>Traditional Treatment</td>
<td>42</td>
<td>29</td>
<td>36</td>
<td>29</td>
</tr>
<tr>
<td>Belief Risk of Disease Is Low</td>
<td>12</td>
<td>105</td>
<td>157</td>
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Family Health Development Division, Ministry of Health
## Incomplete vaccination - Malaysia

<table>
<thead>
<tr>
<th>No.</th>
<th>Reason</th>
<th>Prevalence (%)</th>
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<tbody>
<tr>
<td>1.</td>
<td>No time</td>
<td>19.9</td>
</tr>
<tr>
<td>2.</td>
<td>Child unwell</td>
<td>17.3</td>
</tr>
<tr>
<td>3.</td>
<td>Cost/transport</td>
<td>16.6</td>
</tr>
<tr>
<td>4.</td>
<td>No vaccine stock at private</td>
<td>10.7</td>
</tr>
<tr>
<td>5.</td>
<td>Forgotten</td>
<td>10.0</td>
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<tr>
<td>6.</td>
<td>Not due yet at private</td>
<td>6.2</td>
</tr>
<tr>
<td>7.</td>
<td>Refused vaccine</td>
<td>4.0</td>
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<tr>
<td>8.</td>
<td>Don’t trust vaccine</td>
<td>2.1</td>
</tr>
<tr>
<td>9.</td>
<td>Allergic</td>
<td>1.5</td>
</tr>
<tr>
<td>10.</td>
<td>Doubt Halal</td>
<td>1.3</td>
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### NHMS 2016
- **N** = 10,050
- Incomplete vaccination **n** = 219
  - 2.1% incomplete vaccination
    - 11.3% of them outright refusals
    - Majority default for other reasons
Evolution of an immunisation programme

Potential stages in the evolution of an immunisation programme.

Stage 3: Loss of confidence in smallpox vaccination in the US

Smallpox cases declined between 1802-1840

1850s – ‘irregular’ physicians led challenges to vaccination

1870s- Vaccine use decreased and smallpox outbreaks occurred
Stage 3: Loss of confidence in Pertussis vaccine in Japan

JAPAN stopped DPT 1975

<table>
<thead>
<tr>
<th></th>
<th>NUMBER OF PERTUSSIS CASES</th>
<th>NUMBER OF PERTUSSIS DEATHS</th>
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</thead>
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<tr>
<td>JEPUN 1971-1974</td>
<td>400</td>
<td>10</td>
</tr>
<tr>
<td>JEPUN 1976-1979</td>
<td>13,000</td>
<td>113</td>
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</table>
**Impact of vaccine refusal**

1982 - pertussis component in DTP blamed for causing severe brain damage, seizures and mental retardation

Angry parents formed victim advocacy groups

Lawsuits against vaccine manufacturers were instigated

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**Drop in Production**

- drop in the number of companies producing vaccines
- Increase in vaccine prices

**Law and Regulation**

- National Childhood Vaccine Injury bill in US to protect manufacturers from lawsuits
- Vaccine courts
- Vaccine Adverse Event Report System was created, where suspected side effects of vaccines could be reported by parents and health professionals,
Impact of vaccine refusal

1. Individual Risk

• Children with nonmedical exemptions are at increased risk for acquiring and transmitting VPD.

• In a retrospective cohort study in US from 1985-1992, children with exemptions were 35 times as likely to contract measles

2. Community risk

• increase in local risk of VPD when there is geographic aggregation of persons refusing vaccination

Vaccine Refusal, Mandatory Immunisation, and the Risks of Vaccine-Preventable Diseases, Saad et al, NEJM 2009
Impact of vaccine refusal

Reduced coverage
- Measles immunization rates in UK children dropped from over 90% in 1997 to less than 80% in 2004

Increased Outbreaks
- MMR scare with dropped rates was followed by measles outbreaks and deaths

a purported link between MMR vaccination and autism
Measles outbreak

- 2008-2012 – France – 22,000 cases, 5000 hospitalisation and 10 deaths
- 2013 – spread in Europe
- 2013- 3 large outbreaks in US and 1 in Canada - all were imported cases but in 2014 reports of local outbreaks
- 2016 n 2017 – large outbreaks in Italy and Romania
- Outbreaks will continue to occur as long an imported measles case has the opportunity to expose others who are not immunized.

Measles spread from 4 days before the rash appears, others in the home or local community maybe easily exposed through routine acts of daily living.
Arguments used by Anti-vax 1800s and today – the same

- vaccines are ineffective or cause diseases
- vaccines are used to make profit
- vaccines contain dangerous substances
- harms caused by vaccines are hidden by the authorities
- vaccination mandates violate civil rights
- natural immunity is better than immunity induced by vaccines
- natural approaches to health and alternative products (e.g., homeopathy, vitamins) are superior to vaccines to prevent diseases
- well-educated middle- and upper-income parents who claim the right to make an ‘informed decision’ about vaccination
What makes some parents bias towards anti vax

**Action vs Inaction**

- Studies show that individuals are more averse to the risks associated with an action – getting a possibly ‘unsafe’ vaccine – than to the risks associated with inaction – taking a chance of contracting a vaccine - the ‘omission bias’

**‘Co-incidence Dragon’**

- Tendency to attribute every event occurring after immunization to be caused by vaccination, such as the false association between vaccination and sudden infant death syndrome (the timing of both events)
What makes some parents bias towards anti-vax

'Suspicion Confirmed'
- Exposure to anti-vaccine conspiracy theory (e.g. pharmaceutical companies manipulated research data on vaccine efficacy to make profits)

'Simple to Understand'
- Arguments by anti-vax can convince parents because they are simple to understand and provide explanations for the aetiology of medical conditions that science and medicine have yet to fully explain.
What makes some parents bias towards anti vax

Emotional Sway

- Anti vaccination activists also appeal to emotion by presenting personal stories of parents who strongly believe that their child has been seriously harmed by vaccination.

WIINFM - “What is in it for me”

- Parents think of risk for their own child rather than from a population-based approach often used in public health: what does this risk mean for my family and me?
What makes some parents bias towards anti vax

Internet users – young parents

• Parents who used the Internet to get vaccination information significantly less likely to consider healthcare providers and health authorities as trusted sources of vaccination information

Internet users – worldview regarding health

• E.g. preference for natural immunity, the belief that VPD are needed to build a strong immune system, the idea that it is possible to control exposure to disease or the belief that good hygiene and personal habits can make vaccination unnecessary
What makes some parents bias towards anti vax

**Trusted source of information**

- Internet is also cited as one of the main sources of information on immunization for parents in studies conducted in different countries
- Increase in access to internet from 2000
- Shrinking ‘digital divide’ between high and low income countries
- Worrying - Growing trend to seek health information from user-generated sites such as online news groups and blogs rather than more traditional evidence-based vaccine information sites
What makes some parents bias towards anti vax

Marketing strategy

• Change from the label ‘anti-vaccine’ to pro ‘safe’ vaccine or pro ‘informed-decision’ appearing as vaccine information websites
• very active - a minority of users generating a disproportionate amount of anti-vax content

Scientific findings in the wrong hands

• Findings of studies on safety and efficacy available in internet - shared outside scientific community often using punchy titles and without presenting the details of the scientific information or the context
• Studies on website content – variable info and inaccurate
What makes some parents bias towards anti-vax

Push Factor

• Poor communication health staff
  – E.g. ‘when a mother is harshly criticized in front of other mothers for failure to keep her (vaccination) booklet in good condition, this can create a genuine aversion to the whole vaccination process’

• Not knowledgeable
  – Unable to give information or explain
  – Brush off client’s questions- even parents who vaccinate their children can have doubts and fears about immunization
Learning from smallpox eradication

**WHO eradication programme**

- Began 1967. By 1973, endemic smallpox was confined to five countries.

**Success Factors**

- scarcity of vaccine opposition
  - Disease awareness,
  - trust in vaccine efficacy and
  - the rapid fall in smallpox outbreaks contributed to the
Lessons from Cuba

Achievement

• No measles since 1993,
• No rubella since 1989,
• No mumps since 2010 (only 5 cases since 2000)
• No pertussis since 1994
Lessons from Cuba

Awareness on vaccine and immunisation

- The average person in Cuba knows the country’s vaccine safety program and their personal immunisation records – what immunisation they had, scientific evidence behind them, and what ages they needed to be updated.

Vaccine education

- Starts from the time kids enter school, vaccination is consistently incorporated into courses and class discussions – NOT a course in vaccinology.
Lessons from Cuba

Doctor-Patient Relationship

• High doctor–patient ratio 1:200
• Good relationship with community and government
• Family Doctor and Nurse Program from 1984 – focus preventive program. Meet patients 2x a year, meticulous immunisation records, involved in school campaigns, students get monthly check-up
• this closeness fosters TRUST
Lessons from Cuba

Strong intersectoral relationships

- Population-based organizations, government bodies and ministries
- Committees to Defend the Revolution brings the neighbours on a city block together almost every month to analyze legislation and government policies, discuss neighbourhood problems and shortages, and plan how best to use collective resources
- A key role has been their duty to share information, including news on personal and public health issues
Lessons from Cuba

Community groups shoulder responsibility

- Women’s group tract each baby to ensure they have been immunised – taking responsibility for public health outcomes and awareness
- They have been taught how, been asked to participate and take pride in doing it
Lessons from Cuba

Produce own vaccine

• the spirit of ‘people before profit’, Cuba’s political priority has been to develop its own resources to meet its health needs – including immunisation

• Only one imported - vaccine available for serogroup B meningococcus

Vaccination Strategies

• Vaccination efforts encompass total population (equity)

• Vaccination is integrated into primary health care services

• The program relies on active community participation

• Vaccination is free of charge
WHAT DO WE NEED TO DO

To ensure continued public acceptance of vaccines, essential to:

- Monitor the incidence of AEFIs,
- Scientifically evaluate the likely associations,
- Respond to newly identified risks from vaccines,
- Communicate the benefits and risks to patients and parents through a trusted health care source in advance of the vaccination visit.

- NOT enough for parents to simply agree to get children vaccinated, they need a deeper understanding in order to prevent them from changing their mind.
To clarify common rumours and allegations on vaccine safety focusing on vaccines with decreasing uptake rates.

To garner community support for the NIP and reject anti-vaccine movement

- Transmission of VPDs
- Controversies regarding alternatives to vaccination
- Exploring opinions of pro-vaccination groups.

To promote and strengthen parents' knowledge, beliefs and actions to continue to accept recommended vaccines in the NIP schedule.

National Immunisation Promotion Campaign 2016 - 2020
American Academy of Pediatrics 2005, recommends that pediatricians should

1. listen carefully and respectfully to the parent's concerns,
2. share honestly what is and is not known about the risks and benefits of the vaccine in question,
3. attempt to correct any misperceptions and misinterpretations,
4. assist parents in understanding that the risks of any vaccine should not be considered in isolation but in comparison to the risks of remaining unimmunized,
5. discuss concerns about each vaccine separately,
6. explore the possibility that cost is a reason for refusing,
7. respect and document every refusal.
**Improve delivery of information**

- Hard core – messages can be misconstrued, fear is sometimes not enough

- People who are hesitant are hesitant for a reason –
  - LISTEN
    - There is a lot of scary info on the net
    - They may think the don't need them
  - RESPECTFULLY refute challenges
    - Don’t give up – some need more time
    - The goal isn’t to change everyone's mind but to get above herd immunity levels

Do not be quick to draw a direct causal association between anti-vaccination activism and the decline in vaccine uptake, because many factors contribute to the parental decision to delay or refuse.
Our Role As Health Care Providers

- Not Dismissive
- Earn Trust
- Earnest
- Updated
- Show We Care
- Vigilant
- Differentiate
- Proactive
- Hesitancy From Anti-Vax
Arguments used by Anti-vax 1800s and today

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- well-educated middle- and upper-income parents who claim the right to make an ‘informed decision’ about vaccination
WHEN IT COMES TO DISEASE ERADICATION,

‘THE LAST MILE IS LONGEST’.

As long as anti-vax movement is strong and our collective response weak – outbreaks will occur. Cost will go up - funds, disability and death.