Influenza Severity Assessment

K Vandemaele

Global Influenza Programme
overview

- Why
- How
- Pilot testing
- Way forward
WHO should develop and apply measures that can be used to assess severity of every influenza pandemic.

http://apps.who.int/gb/ebwha/pdf_files/WHA64/A64_10-en.pdf

- By applying, evaluating and refining tools to measure severity every year, WHO and MS will be better prepared to assess severity in next pandemic.

- An early assessment followed by ongoing re-assessment as the pandemic evolves and new information becomes available, bearing in mind that severity will likely vary by place and over time;

- Quantitative values to define descriptive terms (e.g. mild, moderate and severe) to facilitate consistency;

- Use of a “basket of indicators” (e.g. hospitalization rates, mortality data, identification of vulnerable populations and an assessment of the impact on health systems) derived from a pre-agreed minimum data set;

- The expression of confidence and uncertainty around any estimates.
Severity indicators

- Transmission
- Seriousness of disease
- Impact (on health care systems)
Transmission

- Reflects the ease of movement of the influenza virus between individuals, communities, and countries. A virus that has a high human-to-human transmission will spread rapidly from one person to another.

- Combination of
  - the ability to invade and establish infection in humans
  - the dynamics of the spread (interaction patterns, nature of contact)
  - the susceptibility of the exposed population.
  - Climatic factors

- During seasonal influenza: main parameter is intensity as a proxy for transmission

- Special studies for
  - The dynamics of the spread
  - The susceptibility of the exposed population.
Seriousness of disease

- An influenza virus that has a high level of clinical severity can result in a disproportionate number of persons with serious or grave illness and deaths.

- The severity or virulence of an influenza virus will also depend on the presence of underlying medical conditions that predispose individuals to severe illness, as well as age.
Impact

- represents the impact mainly on the health-care sector
  - health-care utilization
  - impact on the health-care work force.

- impact on the health sector will also be influenced by public concern and health-care policies put in place in response to the event. As such, assessing impact will aid in understanding how these issues interact with inherent characteristics of the virus and the way it behaves.

- The public health event may also result in societal and economic consequences, such as absenteeism from workplaces and schools, loss of critical infrastructure, and decreases in trade and tourism.
How to measure the indicators?

- WHO technical working group on PISA
  - Agreed list of parameters to inform 3 indicators (transmission, seriousness of disease, impact) routinely collected in seasonal influenza and collected during special studies.
  - Quantitative information
Categorize values for the parameter

- Absolute values are not comparable between countries
- Need for common denominator
- When put into context with historical data, it is possible to assign them a category and compare parameters between countries

<table>
<thead>
<tr>
<th>Seasonal activity range</th>
<th>Below seasonal threshold</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Extra-ordinary</th>
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Comparison with previous seasons

WHO method

The boxplot visualizes the spread of the historical peaks.

Mean of the influenza positivity after aligning at the median peak for the years 2005-2013 (excluding 2009)

90% CI boundaries

Influenza positivity (%) vs. Weeks

0 10 20 30 40 50 60

1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51

Weeks
Comparison with previous seasons

The MEM-intensity levels based on the 40%, 90% and 97.5% of the upper CI of the geometric mean of the rates during the epidemic period.

Automated intensity-Albania (ARI)

Influenza detections
ARI rate
Low threshold
Medium threshold
High threshold
Very high threshold

Very high
High
Low
Baseline

T. Meerhoff¹, P. Jorgensen², T. Vega Alonso³, J.E. Lozano Alonso³, C.S. Brown², *EuroFlu member
Parameters (quantitative information) feed into indicators

- Parameter 1
- Parameter 2
- Parameter 3
- Parameter 4
- Parameter 5
- Parameter 6
- Parameter 7

Transmission indicator

Seriousness of disease indicator

Impact indicator
# Indicators and their categories

## Transmission

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**Level of confidence**

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## Seriousness of disease

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## Impact

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Pilot testing

- Countries participating: Australia, Bangladesh, Canada, Chile, Germany, India, Japan, Madagascar, New Zealand, Singapore, South Africa, Thailand?, UK, USA

- Steps:
  - Define at national level the parameters for each indicator
    - Which ones do you trust most
    - Timeliness, representative, reliable, stable over time
    - Historical data
  - Categorize values for the parameters
    - This can be done by threshold setting
    - Reality check by using values from previous years and assigning them into the boxes
  - Combine the parameters, and give an qualitative assessment of the indicator into the categories
  - Give a confidence level to the score/assessment
Way forward

1-2 June 2015: PISA follow up meeting

Objectives

- Present and share findings and experience from the pilot testing.
- Finalise ways to set thresholds
- Finalise the framework of analysis of parameter data and presentation of PISA results
- Discuss special study protocol development
- Develop an action plan for further roll out
Acknowledgment

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