What is the role of herd immunity in the decision making process of parents to their children (not) to get vaccinated?

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Measles still spreading in Europe, WHO warns, with 35 deaths over past year

By Victoria Knight, CNN

Updated 1902 GMT (0302 HKT) July 11, 2017

How vaccines stop diseases like measles 01:26
Introduction & background

Acceptor	 Refusers	 Hesitant

Source: De Standaard, 3rd August ‘17
Introduction – ‘Herd immunity’

Figure 1. Diagram illustrating transmission of an infection with a basic reproduction number $R_0 = 4$ (see Table 1). A. Transmission over 3 generations after introduction into a totally susceptible population (1 case would lead to 4 cases and then to 16 cases). B. Expected transmissions if $(R_0 - 1)/R_0 = 1 - 1/R_0 = 3/4$ of the population is immune. Under this circumstance, all but 1 of the contacts for each case is immune, and so each case leads to only 1 successful transmission of the infection. This implies constant incidence over time. If a greater proportion are immune, then incidence will decline. On this basis, $(R_0 - 1)/R_0$ is known as the “herd immunity threshold.”

This is Ben.

He is immunocompromised and cannot have certain (live) vaccines. But thanks to community immunity, he is protected from major diseases.

By vaccinating, you are not only protecting yourself and your children, but also people unable to be vaccinated.

Research questions

1. Knowledge herd immunity?
2. Role of child’s environment in decision-making?

A. Rely on herd immunity: hesitant parents vs other?
B. Vaccines delayed: hesitant vs other?
Methods

Survey in parents (Mol region, Flanders, Belgium)

- Schools
  - 2nd kindergarten (5yrs)
  - 6th primary (12yrs)

- Paper or online questionnaire
  1. Socio-demographics
  2. Vaccination
  3. Herd immunity
Results - Sociodemographics

- N= 263
- Response rate: 57.6%
- 85% in traditional families

Response

- 2nd Kindergarten: 51%
- 6th Primary: 49%

Relation to child

- Mother: 85.50%
- Father: 14.50%
Results - Vaccination

Who’s deciding?

- Both parents: 84%
- Mother: 14%
- Father: 1%
- Other: 1%

Got all recommended vaccinations?

- Yes: 91.80%
- No: 5.20%
- Don't know: 3.00%

Reasons:

1. Protecting own child against disease
2. MD recommendation

... Protecting others (HI)
Results – Vaccine hesitancy

- **Never**: 83%
- **Sometimes/often**: 16%
- **Refusal**: 1%

**Hesitancy & delaying**

- **No**: 88%
- **Yes, but none delayed**: 11%
- **Yes, and delayed**: 2%
Results

“Are you familiar with herd-immunity/community-immunity in the context of vaccinations? “

No differences:
• Religious vs atheist
• Refusing vs non-refusing
• Hesitant vs non-hesitant

HI-knowing and education level parents

Chi-square p= 0.002
Results

“There is a chance that a classmate of my child contracts e.g. measles, if I do not let my child get vaccinated against it.”

Concept herd immunity

- 61% Agree
- 20% Disagree
- 20% No idea

“HI-supporting” vs “not HI-supporting”

No differences with:
- Refusing vs non-refusing
- Hesitant vs non-hesitant

Chi-square p = 0.030
If there would be an outbreak (e.g., measles) in the school, I would blame the parents who did not get their children vaccinated.

Parents that let not get their child vaccinated, are posing a risk to others

Vaccinating my child is important for the health of others (in my environment)
If all other classmates are vaccinating, I am less inclined to vaccinate my own child

If a classmate is not vaccinated because of medical reasons, I am more inclined to vaccinate my own child
Results

“If a classmate is not vaccinated because of medical reasons, I am more inclined to vaccinate my own child”

![Bar chart showing responses to the statement]

- Agree: 51% (HI-supporting), 28% (Not HI-supporting)
- Disagree: 35% (HI-supporting), 57% (Not HI-supporting)
- Don't know: 15% (HI-supporting), 16% (Not HI-supporting)

Chi-square: p < 0.001
Conclusion

Knowledge herd immunity ▶ Limited

No difference in knowledge between hesitant and not hesitant
- Hesitant parents mostly don’t delay vaccinations

Parents find vaccinating their child important for others’ health

Parents do not consider herd immunity in the decision to (not) vaccinate their child. However, HI-supporting are more inclined to do so.

Referring to herd immunity:
- To all parents: not useful
- Hesitant parents: In the context of medical reasons statement, this could be useful
Thank you for your attention!

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