Gaps in Knowledge and Setting the Path Forward
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Key questions for evaluating a proposed influenza vaccination policy:

- What are the likely health impacts of the policy?
- What are the likely economic impacts of the policy?
- What are the costs of implementing the policy?
- How does the policy compare with other policies?
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- To evaluate the health benefits we need to consider both the *direct* and *indirect* impacts of the vaccination policy.
- The direct impact is the benefit to the person who is vaccinated.
- The indirect impact is the benefit to those who are not vaccinated due to herd immunity.
- To account for both direct and indirect benefits transmission dynamic models are required.
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- Beneficial impact of vaccinating young children on all cause absenteeism in schools (apparent benefits included both a direct effect as well as an indirect or herd effect on reducing school absenteeism during influenza outbreaks) [James et al. Vaccine 2012].

- Seasonal influenza vaccination program in England (targeted to individuals over 65 years and in clinical risk groups) may reduce the incidence of influenza illness from 8.2% to 5.9% (with 56-73% of the reduction arising due to indirect protection) and also provides good value for money in years when the vaccine strains are well matched [Baguelin et al. vaccine. 2012].

- Seasonal influenza vaccination program between September and December for pregnant women in their second or third trimester in the England and Wales [Jit et al. vaccine 2010] and in the US was found to be cost-effective [Myers et al. Am J]
Gaps in Knowledge and Setting the Path Forward

- Burden of influenza, target groups for each vaccine, vaccine coverage, and epidemiological impact of vaccination program
- Live attenuated influenza vaccine (LAIV) or trivalent inactivated influenza vaccine (TIV) and vaccine efficacy and severity of circulating strain
- Vaccine for pandemic or seasonal influenza or both
- Vaccine uptake
- Sharing (regional and global level)
Gaps in Knowledge and Setting the Path Forward

Burden of influenza, target groups for each vaccine, vaccine coverage, and epidemiological impact of vaccination program

- The burden of influenza in different countries and regions, and among different population groups needs to be determined.

- The effect of vaccination in reducing the burden of influenza-related disease for specific subgroups also needs to be estimated in order to inform decisions to target certain groups for vaccination.

- The cost-effectiveness (or cost-utility) of vaccination policies in different countries needs to be considered.
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- Live attenuated influenza vaccine (LAIV) or trivalent inactivated influenza vaccine (TIV) and vaccine efficacy and severity of circulating strain
  - There are substantial gaps in the evidence base for some age groups with regard to efficacy of LAIV and TIV.
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Vaccine for pandemic or seasonal influenza or both: key issues

• Timelines of vaccine supply and demand for seasonal and pandemic influenza.

• Capacity to manufacture vaccine in both the short and long term, and surge capacity.
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- **Vaccine uptake considerations**
  
  - What are the main drivers of decisions to vaccinate (prevention of influenza, reduction of symptoms, doctors’ recommendation etc)?
  
  - What are the main barriers for decisions to vaccinate (concerns about vaccine safety, doubts about the necessity or benefits of the vaccination, and the inconvenience of getting vaccinated).
Gaps in Knowledge and Setting the Path Forward

- Sharing (regional and global level)

Strategies for containing an emerging influenza pandemic in Southeast Asia

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Highly pathogenic H5N1 influenza A viruses are now endemic in avian populations in Southeast Asia, and human cases continue to accumulate. Although currently incapable of sustained human-to-human transmission, H5N1 represents a serious pandemic threat owing to the risk of a mutation or reassortment generating a virus with increased transmissibility. Identifying public health interventions that might be able to halt a pandemic in its earliest stages is therefore a priority. Here we use a simulation model of influenza transmission in Southeast Asia to evaluate the potential effectiveness of targeted mass prophylactic use of antiviral drugs as a containment strategy. Other interventions aimed at reducing population contact rates are also examined as reinforcements to an antiviral-based containment policy. We show that elimination of a nascent pandemic may be feasible using a combination of geographically targeted prophylaxis and social distancing measures, if the basic reproduction number of the new virus is below 1.8. We predict that a stockpile of 3 million courses of antiviral drugs should be sufficient for elimination. Policy effectiveness depends critically on how quickly clinical cases are diagnosed and the speed with which antiviral drugs can be distributed.