What is the efficacy of H1N1 vaccine in mitigating symptoms and limiting pandemic spread

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Influenza virus infections result in major health and economic burdens worldwide.

The WHO estimates that the average global burden of inter-pandemic influenza is approximately

- 1 billion cases of influenza.
- 3-5 million case of severe illness.
- 3-5 lakhs death annually.
Etiology

- Influenza is caused by three types of orthomyxo virus named as Influenza A, B, and C.
- Type B commonly causes epidemic and C causes sporadic outbreak of seasonal influenza.
- Type A had been found to cause Influenza pandemic.
The latest pandemic happened in 2009 by Type A pandemic H1N1 2009 virus.
The World Health Organization (WHO) has reported, as of September 2009, that the influenza A (H1N1) pandemic has originated
- >300,000 laboratory-confirmed cases.
- 3917 deaths in 191 countries.
First case of Influenza A (H1N1) 2009 was identified in Bangladesh on 18th June 2009.
Up to April 2010, 1053 cases identified & 07 laboratory confirmed patients died.
On August 10, 2010, the WHO declared an end to the 2009 H1N1 influenza pandemic. 

Pandemic (H1N1) 2009 virus has been establishing now as a member of seasonal influenza in some regions.
Vaccination is the principal strategy to reduce the transmission of influenza and to prevent or alternate illness severity as-

- Pandemic influenza demonstrate rapid and efficient person to person transmission.
- Hospitalization and case fatality rates were higher for pandemic influenza than seasonal influenza.
A pandemic (H1N1)2009-specific vaccine began after the emergence and rapid global spread of pandemic influenza A(H1N1) 2009 virus. Bangladesh began its H1N1 pandemic vaccination program on May, 2010.
The target was 15.6 million people who fall in the priority groups including:

- health care providers.
- children > 6 months.
- pregnant women.
- patients with chronic medical condition, such as COPD, DM, heart disease etc.
According to CDC H1N1 vaccine -

- In healthy young adult vaccine is 70-90% effective in preventing illness.
- It reduces hospitalization by about 70% and death by about 85% among the elderly who are not in nursing home.
Among nursing home residents, vaccine reduce risk of hospitalization by about 50%, pneumonia by about 60% and risk of death by 75%-80%.

In the elderly and those with certain chronic medical conditions such as HIV, the vaccine is often less effective in preventing illness.

They will not prevent influenza like illness (ILI) caused by other virus.
Effectiveness of H1N1 vaccine for the prevention of pandemic influenza in Scotland, UK - a retrospective observational cohort study -

The effectiveness of H1N1 vaccination for prevention of emergency hospital admission from influenza related disorder was 19.5% (95% CI 0.8-34.7)

The vaccine effectiveness in preventing laboratory confirmed influenza was 77.0% (95% CI 2.0-95.0)

Lancet infc. Ds, 2012 Sept, 12(9):696-702
Effectiveness of the pandemic H1N1 influenza vaccines against laboratory-confirmed H1N1 infections: population-based case-control study

- The H1N1 vaccine was 86% (95%CI 75-93%) effective in preventing laboratory-confirmed H1N1 infections when vaccination occurred ≥14 days before testing.
Effectiveness seemed lower among older (≥50 years) individuals which is 51% (95% CI -51 to 84%) and 67% (95% CI -13 to 90%) among those with immuno compromised conditions.

Effectiveness of seasonal 2008-2009, 2009-2010 and pandemic vaccine, to prevent influenza hospitalization during autumn 2009 influenza pandemic wave in Spain- case control study-

- Pandemic H1N1 vaccine was associated with an adjusted vaccine effectiveness of 90.0%(95.0% CI 48.0-100)
- Pandemic vaccine was effective in preventing pandemic influenza associated hospitalization.

www.ncbi.nlm.nih.gov/pubmed/20875486
Effectiveness of seasonal influenza vaccine against pandemic (H1N1) 2009 virus - Australia 2010 - case control study -

- Effectiveness of monovalent H1N1 vaccine only was 67% (95% CI 33-84).
- The H1N1 vaccine against pandemic (H1N1) 2009 virus is less effective than seasonal trivalent vaccine.

EID journal, vol. 17, no. 7—July 2011
Effectiveness of vaccine against pandemic influenza A/H1N1 among people with underlying chronic diseases: cohort study, Denmark, 2009-2010-

- The effectiveness of pandemic vaccine against confirmed H1N1 infection was 49% (95% CI 10 to 70).
- The effectiveness of vaccine against admission to hospital for confirmed H1N1 infection was 44% (95% CI −19 to 73). It offered non-significant protection against influenza related hospital admissions.

- BMJ 2012;344:d7901
Effect of vaccines and anti virals during the major 2009 A(H1N1) pandemic wave in Norway and the influence of vaccination timing.

- The countermeasures prevented approximately 11-12% of potential cases relative to an unmitigated pandemic.
- Vaccination was found responsible for roughly 3 in 4 of the avoided infections.
An estimated 50% reduction in the clinical attack rate would have resulted from vaccination alone.

Vaccination timing was a critical factor in relation to the spread of the 2009 A(H1N1) influenza.

Epidemiologic parameters and evaluation of control measure for 2009 novel influenza a (H1N1) in Xiamen, Fujian Province, China.

- An epidemic curve showed that vaccination cut the peak incidence of illness significantly.
- Vaccination effectively limited the spread of the influenza pandemic and reduced the epidemic peak.

Vaccines against influenza A (H1N1) pandemic - cohort study in Mexico.

- Vaccination strategies in Mexico decreased severe outcomes, slowing transmission, protecting groups at increased risk, reduced complications and death, thus preventing overload of health services.
Field effectiveness of pandemic and 2009-2010 seasonal vaccines against 2009-2010 A(H1N1) influenza: estimations from surveillance data in France.

- The effectiveness of pandemic vaccines in preventing ILI was 52% (95% CI 30 to 69) during the pandemic and 33% (95% CI 4 to 55) after.
- It was 86% effective (95% CI 56 to 98) against confirmed influenza.
The effectiveness of seasonal vaccines against ILI was 61% (95% CI 56 to 66) during the pandemic and 19% (95% CI -10 to 41) after.

It was 60% (95% CI 41 to 74) against confirmed influenza.

Management of influenza pandemic is a perpetual challenge for health sectors. We should be prepared for the possibility of a pandemic and be ready to respond to the threat. So vaccination is required to slow the spread of infection, protect people from developing severe disease and to lessen the impact of influenza.
Get the Shot, Not the Flu