

Slum-dwellers are relatively resistant to swine flu

The present H1N1 swine flu pandemic started as an outbreak in Mexico in March–April 2009. By July there were more than 10,000 laboratory confirmed cases with 119 deaths worldwide¹. Major worry is that the present pandemic has many similarities with the devastating 1918–19 swine flu pandemic which killed about 50–100 million people worldwide (17 million in India). Both started in spring and affected young individual disproportionately. In Mexico 87% of the deaths, which were predominantly due to pneumonia, were individuals aged between 5 and 59 years. This is in contrast to the ‘seasonal’ flu where mortality is mostly restricted to senior citizens. In India the picture is no different, 75% of the deaths in Pune have been in people below 60 years of age.

Swine flu arrived in India on 13 May, through a passenger who travelled from USA to Hyderabad. Reeda Shaikh, a 14-year-old student, who died in Pune on 3 August 2009, was its first victim. Since then there is public panic created by a combination of media hype and nervous, unconvincing health authorities. Till 3 September a total of 111 people have succumbed to the flu in India. Maharashtra accounted for 58 deaths, of which 34 (58%) are from Pune².

General perception is that slum-dwellers would be highly susceptible to swine flu, but the facts indicate otherwise. Of the 34 deaths, only 2 victims (one adult and one infant) were from the

slums (*Times of India*, Pune: 4 August to 4 September 2009). Slums account for 42% of Pune’s population. However, only 6% of flu deaths were from slums, an indication that slum dwellers exhibit some resistance to the flu virus. The first flu victim from a slum was a 35-year-old lady, also a case of mitral stenosis, who died on 26 August. She had shown flu signs about a week earlier when she would have been highly infectious. Incubation period of flu is generally 1–4 days. Considering the living conditions in slums, the virus should have spread like a fire resulting in an avalanche of positive cases. Nothing like that happened. Even her two children tested negative for the virus (*TOI*, Pune: 27 August 2009). In fact the pandemic is now waning². During the last 10 days, the average number of positive cases in Pune has been 10 per day, which is about one fourth of the peak that was seen between 7 and 21 August 2009.

These observations indicate that slum dwellers are relatively resistant to swine flu. Mechanism of protection needs further investigation. Current epidemic is caused by a novel reassortant virus containing genes from swine (North American swine 30.6%, Eurasian swine 17.5%), avian (34.6%) and human (17.5%) flu viruses³. The relative proportions of the viral genes are 48.1%, 34.6% and 17.5% respectively. Swine are frequent inhabitants of slums. The slum population could get cross immunity from continu-

ous subclinical exposures to swine viruses. Exposure to other infections, which are common in crowded slums, could also confer cross immunity. Cytokine storm, a response to viral antigens, is thought to be the major pathogenetic mechanism of swine flu pneumonia⁴ and a healthy immune system appears to be a liability rather than an asset. In a recent survey we have found that 16% of slum dwellers in Pune are grossly underweight (data not shown). Malnutrition impairs cytokine production⁵ and could also be a plausible mechanism of relative resistance to the flu observed in slum dwellers of Pune.

1. Thorner, A. R., *Epidemiology, clinical manifestations and diagnosis of pandemic H1N1 influenza (swine influenza)*; www.utdol.com/home/content/topic.do?topicKey=pulm
2. Daily Press Releases on SWINE FLU: Ministry of Health, Government of India; <http://india.gov.in/citizen/health/h1n1.php>
3. Cohen, J., *Science*, 2009, **324**, 700–702.
4. Chan, M. C. W. *et al.*, *Resp. Res.*, 2005, **6**, 135–148.
5. Rodríguez, L. *et al.*, *Clin. Diagn. Lab. Immunol.*, 2005, **12**, 502–507.

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