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LETTER TO THE EDITOR

Re: Relationship between vaccine vial monitors and cold chain infrastructure in a rural district of India

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Re: Relationship between vaccine vial monitors and cold chain infrastructure in a rural district of India
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Dear Editor

The recent research study into the ground realities of storage and distribution of oral polio vaccine (OPV) related cold chain infrastructure in rural India[1] was outstanding and worthy of emulation. However the inability to retrieve OPV samples from the field during the exercise was regrettable. Quantification of the live viral content at different stages from sub-health centres would have revealed objectively the outcome of international and national efforts to deliver adequate live viral content of all three polio serotypes to every vaccinee.

This 21st century rural scenario appears to be a mirror image of the urban picture three decades earlier. During the 1970s field studies were conducted in diverse urban locations in different parts of India. There was no significant loss in viable viral particles in 113 of the 191 retrieved OPV aliquots. The storage and vaccine dispensing practices, availability of standby generators, and OPV vials without stoppers were all observed[2]. In all probability, the 21st century picture at the sub-health urban centre level was not different from that of the current rural districts[1].

Vaccine vial monitors (VVM) are used to guide management of warehousing or dispensing of OPV aliquots. The use of VVM is based on chemical changes induced by heat, and thus they are thermal and not biological indicators, making them fallible. For instance, they do not reflect evaporative and radiative transfer of heat from the atmosphere. During the 1995 heat wave in Chicago, USA, the temperature was 40°C, but the heat index, an estimate of evaporative and radiative transfer of heat, was 48.3°C[3]. Furthermore, VVM do not record spikes in temperature variation, exposure to sunlight, humidity or prolonged exposure to lower temperatures. While freezing would not damage OPV, for

other vaccines, including hepatitis B vaccine or the enhanced potency inactivated poliovirus vaccine, it would be adverse; VVM would be silent about such accidents.

Identical investigations should be recommended as a priority in different continents to address possible natural disasters or bio-terrorism misadventures. For instance, in August 2005 the after-effects of Hurricane Katrina were associated with prolonged power shut down when the auxiliary generators in hospitals and labs ran out of fuel[4].

With no prejudice to the article's recommendations to strengthen the power supply system, improve refrigeration in vaccine carriers and portable thermoelectric coolers[1], research must also be directed towards stabilized vaccine formulations. Experimental OPV production lots have been stabilized by the addition of pirodavir and deuterium oxide to withstand 42°C for 10 hours[5].

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