

## “VaccineSafe” Vs Conventional Ice-Lined Refrigerator (ILR).

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All vaccines are heat sensitive and some are both heat and light sensitive, some freeze sensitive – all need to be kept between critically set temperature between 2<sup>o</sup> and 8<sup>o</sup>C (both inclusive). In India, Govt sector has the right cold chain equipments but Private sector is deprived of this luxury. All efforts made in procuring the right equipment by the author were in vain. With the help of local refrigeration engineer attached to the Medical and Engineering college, could locally develop ice-lined refrigerator ranging from 5L – the prototype, 12L, 20L and ~70L since 2005. This is named as “VaccineSafe” by the author.

### About “VaccineSafe”



“VaccineSafe” is locally designed and developed Ice-Lined Refrigerator for private sector which is in use with limited number of private practitioners since 2005 in Karnataka including KVG Medical College since 2011.

The equipment is plugged to 5amps 3 pin socket with proper earthing and connected through dedicated voltage stabilizer.

Thermostat cum external temperature display is critically set between 2<sup>o</sup> and 4<sup>o</sup>C with compression cycle of short duration, exerts minimal fatigue hence compressor enjoys long life.



The first prototype had 5L space for keeping vaccine (Table Top model). The present one has ~70L space for keeping vaccine in single zone and single basket (unlike in the Govt sector with 2 zones and minimum 3 baskets). It has concealed ice-lining and additional conditioned icepacks are placed around the containers for extending “cold holdover time”. Cylindrical perforated transparent plastic containers are used for keeping vaccines / respective diluent. The bottom tier can easily accommodate vaccine vials enough for one month for our vaccination clinic in the College. Running vials of Vaccines of Open Vial Policy (OVP) are placed in smaller container and kept over the bottom bigger containers. Vaccination is done in the same room, sparing a separate vaccine carrier.



Vaccination clinic in our College is the “Nursing station” for administering Mantoux (Tuberculin Skin) Test as OVP is applicable to Tuberculin PPD-S, requiring cold-chain. It is kept in a separate container in a mesh tray suspended by the basket.



Dedicated Cold Chain Handler cum Vaccinator appointed as staff nurse is in charge of the vaccination clinic. She has served ~10 years in Primary Health Centre Sampaje, has undergone training in routine immunization as per WHO / GOI guidelines. Author provides supportive supervision.

**About present Ice Lined Refrigerators available in the Planning Units – Govt Sector.**



140L ILR with 3 baskets in 2 zones, providing 85L cabinet space for keeping vaccines / diluents is the commonest model. Each basket has ~21L space. 3 baskets provide ~60L space of which ~60% (<40L) is for keeping vaccine + diluents, remaining is free space for air circulation around “cartons”. Another common model is also having 3 baskets with ~14L space per basket. But surprisingly, each basket, irrespective 21L or 14L can hold same quantity of vaccines / diluents. Whenever vaccine is to be removed from the bottom basket, vaccines kept in the left upper basket experience temperature excursion.



**Sur-‘priZe’**

Vestfrost 20.6 ltr basket space, holding 9 cartons/3050 doses of mixed antigens with diluents in 9 ltr carton space with 56% free space.

Haier 13.8ltr basket space can hold the same with 35% free space.

Vestfrost

Haier

If 35% air circulation space is acceptable any of the model can serve the purpose with the present method of keeping vaccines as per RI Handbook for MO’s.

Whereas present model **“VaccineSafe”** with single basket provides >45L space for keeping vaccines / diluents and no temperature excursion to other vaccines while removing one vaccine -- all being in one zone. Mesh tray suspended from the upper rim of the basket is handy for private practitioners to keep single dose vaccines.

Author is ‘dreaming’ another model with multiple **‘Drawers’** for use by private practitioners in India which can greatly solve cold-chain issue: looking for a manufacturer for collaboration.