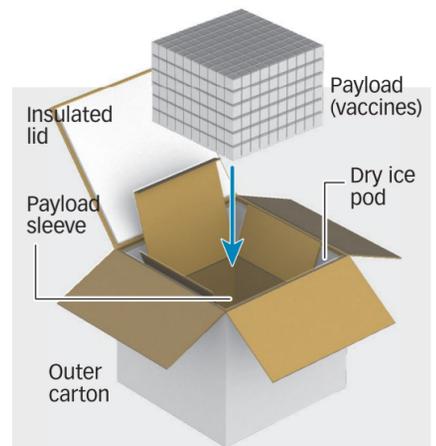


# A vaccine's journey

The Health Sciences Authority is in talks with at least one vaccine developer to distribute Covid-19 vaccines in Singapore once its candidate is ready. According to a recent report on vaccine distribution by DHL, these are the paths the vaccines might take to get to our hospitals and clinics. **BY LEILA LAI**



**1** Vaccines are transported in cooling boxes or pallet shippers from the manufacturer to distribution terminals, warehouses or directly to recipients in the destination country.



## Keeping things cool

Two of the leading vaccine candidates must be kept at sub-zero temperatures ranging from -20 to -70 degrees Celsius throughout the transport process. Temperature-controlled containers, data loggers and monitoring devices will play a key role in maintaining the right temperatures as the vials are transferred from one stage to the next.

### Pfizer

The vaccine developer has developed its own shipping container, which uses dry ice to keep temperatures at -70 degrees Celsius for up to 10 days if the box is unopened. Regular dry ice replenishment can extend that to 30 days.

### DHL

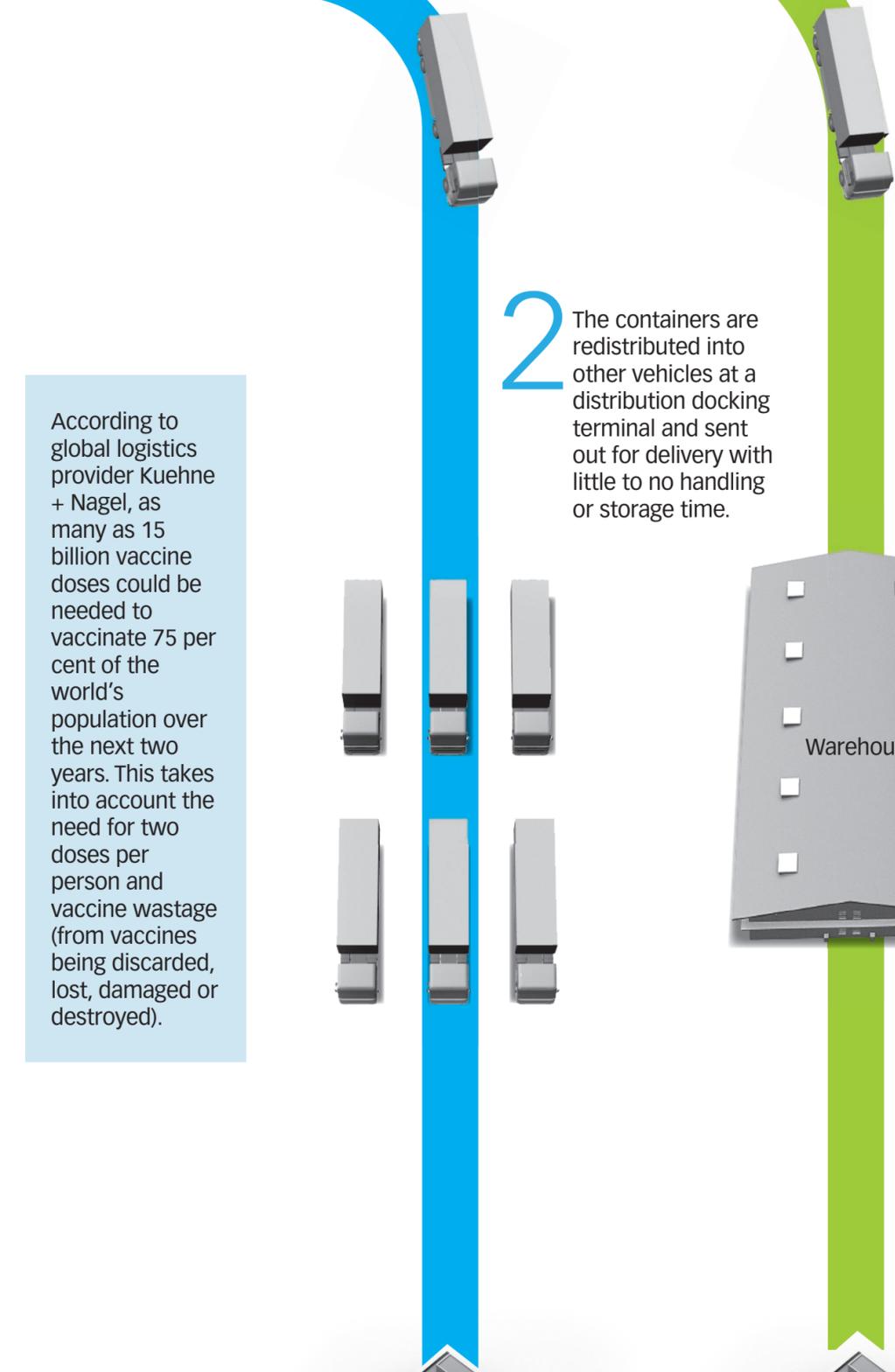
DHL selects temperature-controlled containers with the proper validation and accreditation from options available in the market. With technology like phase change material (PCM) and, if necessary, intervention measures like dry ice replenishment and plug-ins at storage terminals, these containers can maintain their temperature control for the duration of a typical move from pick-up to arrival, said Leonora Lim, vice president of life science and healthcare at DHL Customer Solutions and Innovation, Asia Pacific.

### Zuellig Pharma

The healthcare services company focuses on destination storage and last-mile solutions in Asia, and has its own eZCooler packaging solution that can maintain storage temperatures down to -25 degrees Celsius. The passive packaging system uses PCM and vacuum insulation panels to maintain required environmental temperatures for up to four days, or long enough to reach even remote areas by road or air, and can be modified to handle temperatures below -40 degrees Celsius. Zuellig Pharma also uses a blockchain-based eTracker app to authenticate the provenance of products handled throughout the supply chain.

### YCH Group

Besides insulated cool boxes, the home-grown supply chain solutions provider uses smart portable chillers that can maintain temperatures of -80 degrees Celsius. This is achieved using AC current, and each chiller is equipped with a backup battery able to last eight hours without power supply in the event of an outage. In addition, YCH Group monitors temperatures throughout transportation with an intelligent solution called SCRY, which uses Internet of Things technology. Alerts will be sent at various temperature levels, prompting drivers or staff to check on the containers if temperatures fall out of range.



**2** The containers are redistributed into other vehicles at a distribution docking terminal and sent out for delivery with little to no handling or storage time.

**3** The containers are received at a local warehouse to be stored and repacked into smaller units for delivery.

According to global logistics provider Kuehne + Nagel, as many as 15 billion vaccine doses could be needed to vaccinate 75 per cent of the world's population over the next two years. This takes into account the need for two doses per person and vaccine wastage (from vaccines being discarded, lost, damaged or destroyed).

