Supplementary material 1. Details of the procedures

1. InSurE technique
The infant was positioned according to standard intubation protocol. Following removal of the continuous positive airway pressure (CPAP) nasal mask or prongs, laryngoscopy and intubation were performed. A feeding tube with size adjusted to the selected endotracheal tube (ETT), premeasured to the desired depth was prepared prior to surfactant administration. Once correct ETT placement was confirmed, a syringe containing surfactant was attached to the feeding tube, which was then inserted through the ETT to the predetermined depth. The total surfactant dose was administered in 4 equal aliquots, with gentle bag-and-tube ventilation provided between aliquots. Upon completion, the ETT was promptly removed, and the infant was transitioned back to CPAP support using a nasal mask or prongs.

2. LISA technique
We followed a modified 'take care' method for less invasive surfactant administration (LISA) administration16) wherein a 5Fr infant feeding tube was inserted into the trachea through direct laryngoscopy. A laryngoscope with a Miller 00 blade (for infants <28 weeks gestational age) or a Miller 0 blade (for infants between 28–34 weeks gestational age) was used to directly visualize the glottis. The distal end of the feeding tube was cut to a variable length beyond the fixed black centimetre line, depending on the depth of insertion past the vocal cords. For infants born at 25–26 weeks or with a birth weight (BW) <750 g, 1-cm length was maintained distal to the black marking on the tube. For those at 28–29 weeks or weighing <1,000 g, the length was 1.5 cm, for 30–32 weeks or BW 1,000–2,000 g it was 2 cm, and for infants >32 weeks or BW 2,000–3,000 g it was 2.5 cm. Surfactant was administered using a 5-mL or 10-mL syringe, with an additional 1 mL of air. The total volume was delivered in aliquots of 3 to 4, with pauses of 5–10 seconds in between. The infant remained on nasal CPAP (nCPAP) during the administration, as nCPAP was the primary mode of respiratory support for this age group in our study. No sedation was administered for the LISA procedure. Throughout both procedures, vital signs such as heart rate, respiratory rate, and SpO_2 were continuously monitored.