

Measuring What Matters: A New Approach to Timely Newborn Screening

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Neonatal screening is a time-critical process susceptible to cascading delays that can prevent timely delivery of care. Recommended prevention of screening delays includes aggregate monitoring of key intervals including Sample Transit Time (STT), defined as the time between collection and in-lab receipt. In 2018, Newborn Screening Ontario (NSO) implemented a sample shipping and tracking system (Track-Kit) enabling hospitals and midwives ('submitters') to allocate screening samples to pre-paid shipments and schedule courier pick-ups. This system records the courier pickup scan of each sample, enabling the separation of STT into subcomponents: i) In-Submitter Time (IST); and ii) Courier Transit Time (CTT). Among N = 364,772 samples transiting between October 2022-June 2025 median STT was 48.7 [25th:38.3 – 75th:72.3] hours. Overall, 55% and 45% of cumulative STT hours were attributable to IST and CTT, respectively. The IST:CTT ratio varied time-dependently, with CTT peaking during November-January. End-to-end STT may be an inadequate quality metric capable of obscuring the true origin of screening delays.

To address this limitation, a new approach was developed to isolate the submitter-controllable portion of the pre-analytical process measured by IST. Using timestamps for sample collection and pickup, linked from NSO's Laboratory Information System and Track-Kit respectively, IST was calculated for samples originating from Ontario submitters using Track-Kit. A standardized report was created to summarize individual submitter performance, presenting the number of post-collection business days a submitter's samples awaited pick-up in the preceding three months. Data was stratified by weekday to allow submitters to identify specific days when in-hospital delays occur most.

This report offers a more actionable measure of "transit time", enabling targeted interventions to reduce both in-submitter and courier-based delays. By increasing visibility of submitter-controllable delay, the new metric will support quality improvement efforts that ultimately contribute to faster newborn screening and improved health outcomes for Ontario's newborns.