EE648

Micro-costing Study of Comprehensive Genomic Profiling for Implementation of Precision Cancer Medicine in Public Healthcare Systems:
The Norwegian Infrastructure for Precision Diagnostics and IMPRESS-Norway trial

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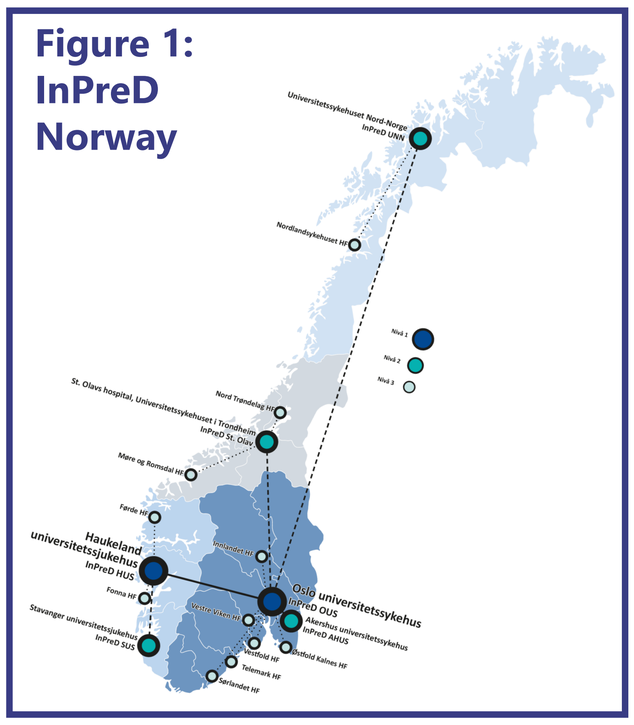
BACKGROUND and OBJECTIVE

- Precision cancer medicine (PCM) relies on comprehensive genomic profiling (CGP) based on next-generation sequencing (NGS). Currently, CGP is resource-intensive.
- Detailed information on resource use related to CGP can inform hospital budgeting, resource input values in cost-effectiveness analysis, and highlight capacity bottlenecks.
- We aimed to conduct a micro-costing study of CGP for PCM in Norway, which is implemented as standard-of-care in the public healthcare system within the national Infrastructure for Precision Diagnostics (InPreD) and IMPRESS-Norway clinical trial (EudraCT: 2020-004414-35).

Figure 1: InPreD Norway



InPreD Norway

- InPreD includes all six university hospitals in Norway (1). Patients with advanced cancers can be referred for CGP trough InPreD, provided by the public healthcare system.
- Analysis is based on the Illumina TrueSightOncology 500 NGS assay targeting 523 genes and using archival tumor tissue samples.
- Findings are discussed by the national molecular tumor board to guide molecular-based therapy recommendations, including inclusion in the researcher-initiated PCM trial IMPRESS-Norway (2).

METHODS

Review of existing micro-costing studies related to CGP to develop a costing framework and comparing results to identify differences in cost categories and levels of detail.

Site visits to the test center in Oslo to map the diagnostic pathway and identify relevant cost components.

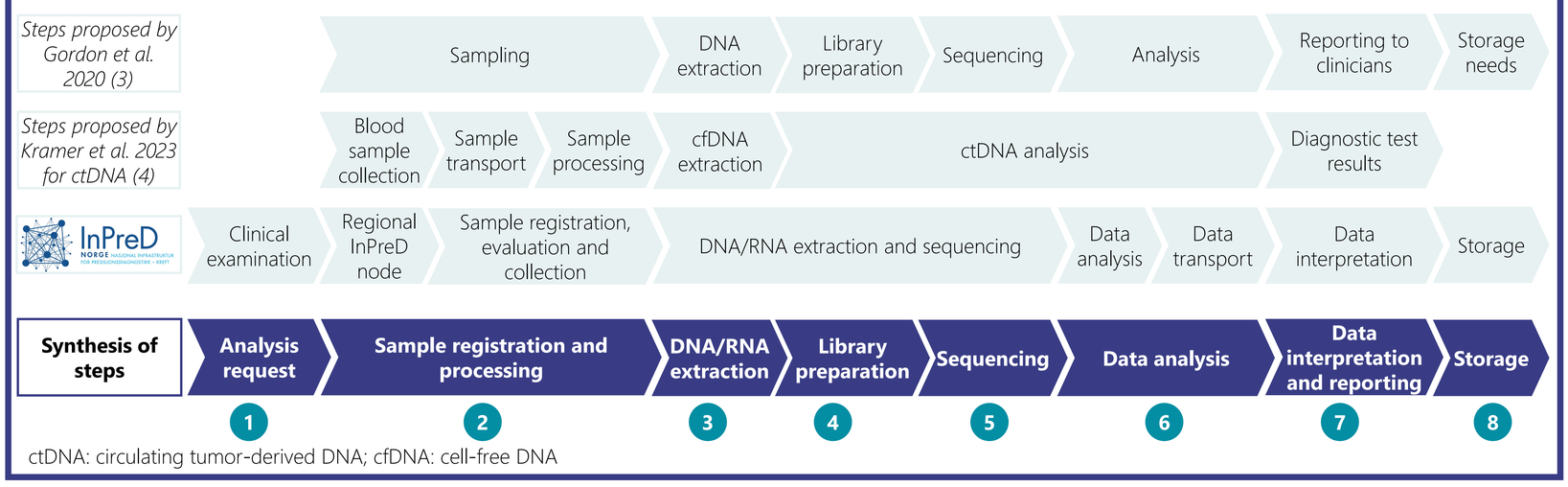
Discussions with associated staff to map the diagnostic pathway and develop a costing model in Excel.

RESULTS

- **Cost categories:** We identified consumables, personnel, software and storage costs, and equipment costs. Consumables were the most impactful cost category in most of the 11 micro-costing studies reviewed. Additionally, overhead costs reflect costs that can less easily be traced to an individual sample, for instance rents and electricity for building or administrative overhead.
- **Workflow steps:** We mapped the diagnostic pathway into 8 steps over 4 weeks, including subject recruitment and data storage, which were often neglected in previous studies (**Figure 2**).
- **Type of costs:** InPreD currently allows for processing of 24 patient samples per week across 4 test centers. To calculate costs with varying batch sizes and to display capacity constraints, we defined costs as variable, step-fixed, or fixed costs. Costs per sample were defined per step and per category:

– Consumables: (number needed per batch and step × unit price) ÷ batch size
– Personnel: (working time per batch and step × hourly wage per profession) ÷ batch size
– Equipment: ((annual capital + maintenance costs) × allocation to InPreD/step) ÷ annual sample size
– Software: (annual license costs × allocation to InPreD/step) ÷ annual sample size

Figure 2: Steps identified in the diagnostic workflow



ctDNA: circulating tumor-derived DNA; cfDNA: cell-free DNA

CONCLUSION

- Our study presents a detailed costing framework and provides insight into potential constraints for higher test capacities.
- Next steps involve valuing input factors using wage rates and price lists for equipment and machines obtained from the test center in Oslo.
- Applying the costing framework to other test centers could then extend our costing model to a generalized costing approach, especially to facilitate cost-effectiveness analyses of CGP.

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