

A Quantitative Framework for Measuring Personalized Medicine Integration into US Healthcare Delivery Organizations

Arushi Agarwal, Daryl Pritchard, Laura Gullett, Kristen Garner Amanti, and Gary Gustavsen

Supplementary Materials

Questionnaire S1: Screener Questions for Survey Participants

1. Which of the following best describes your primary role/department?
 - a. Laboratory
 - b. Biomedical/Clinical Engineering/EBME (Electro-Biomedical Engineering) **[THANK AND TERMINATE]**
 - c. C-Suite Management
 - d. Facilities/Maintenance/Estates Management/Building Services **[THANK AND TERMINATE]**
 - e. Imaging **[THANK AND TERMINATE]**
 - f. Information Technology/Informatics/Medical Informatics
 - g. Nursing **[THANK AND TERMINATE]**
 - h. Patient Safety/Risk Management **[THANK AND TERMINATE]**
 - i. Pharmacy **[THANK AND TERMINATE]**
 - j. Purchasing/Materials Management **[THANK AND TERMINATE]**
 - k. Respiratory Therapy **[THANK AND TERMINATE]**
 - l. Surgery **[THANK AND TERMINATE]**
 - m. Clinical/Quality Research **[THANK AND TERMINATE]**
 - n. Other **[THANK AND TERMINATE]**

2. Which of the following best describes your organization?
 - a. Health System
 - b. Integrated Delivery Network (i.e. health system providing insurance plan)
 - c. Independent Hospital
 - d. Government-Affiliated Hospital (e.g., VA)
 - e. **[If (A) Selected in Q1]** Independent Laboratory **[THANK AND TERMINATE]**
 - f. Private Practice **[THANK AND TERMINATE]**
 - g. Other **[THANK AND TERMINATE]**

3. How long have you worked at your current organization?
 - a. Less than 1 year **[THANK AND TERMINATE]**
 - b. 1-5 years
 - c. 6-10 years
 - d. 16-25 years
 - e. More than 25 years

4. How many hospitals does your organization have?

- a. None **[THANK AND TERMINATE]**
 - b. 1
 - c. 2-5
 - d. 6-10
 - e. 11-25
 - f. 26+
5. Where is the headquarters of your organization?
- a. Northeast (CT, MA, ME, NH, NJ, NY, PA, RI, VT)
 - b. South (AL, AR, DC, DE, FL, GA, KY, LA, MD, MI, NC, OK, SC, TN, TX, VA, WV)
 - c. Midwest (IA, IL, IN, KS, MI, MN, MO, NE, ND, OH, SD, WI)
 - d. West (AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY)
 - e. Outside of the US **[THANK AND TERMINATE]**
6. Which of the following does your organization include? Select all that apply.
- a. Teaching Hospital(s)
 - b. Clinical Trials
 - c. Medical School
7. For which of the following clinical areas does your organization treat patients? Select all that apply.
- a. Oncology
 - b. Rare/Undiagnosed Diseases
 - c. Chronic Diseases
 - d. Preventive/Healthy Patient Care
 - e. Prenatal/Neonatal Care
 - f. I don't know **[THANK AND TERMINATE]**
8. For which of the following clinical areas do physicians at your organization use any personalized medicine approaches? Select all that apply.
- Personalized medicine encompasses any therapeutic interventions that are tailored based on the unique physiological or biological characteristics (often genetic/molecular) of an individual or disease state.*
- a. Oncology
 - b. Rare/Undiagnosed Diseases
 - c. Pharmacogenomics/Chronic Diseases
 - d. Preventive/Healthy Patient Care
 - e. Prenatal/Neonatal Care
 - f. None **[THANK AND TERMINATE]**
 - g. I don't know **[THANK AND TERMINATE]**
9. **[If (A) Selected in Q1]** How would you classify your primary laboratory?
- a. Research laboratory **[THANK AND TERMINATE]**
 - b. Clinical laboratory

- c. Other **[THANK AND TERMINATE]**
10. **[If (A) Selected in Q1]** Which of the following most closely matches your title or role?
- a. Laboratory director
 - b. Laboratory manager/supervisor
 - c. Staff pathologist **[THANK AND TERMINATE]**
 - d. Laboratory tech, lead tech, or medical tech **[THANK AND TERMINATE]**
11. **[If (A) Selected in Q1]** Which sections of the laboratory do you manage and/or supervise? Select all that apply.
- a. Histology
 - b. Cytology
 - c. Cytogenetics
 - d. Flow cytometry
 - e. Clinical chemistry
 - f. Immunoassay
 - g. Coagulation
 - h. Hematology
 - i. Urinalysis
 - j. Molecular (e.g., PCR, NGS, etc.) **[THANK AND TERMINATE IF NOT SELECTED]**
 - k. Microbiology
12. **[If (A) Selected in Q1]** For which of the following clinical areas do you directly supervise/manage testing? Testing may be performed either in-house or as send-outs. Select all that apply.
- a. Virology (e.g., HIV, HCV testing)
 - b. Women's health (e.g., HPV, STI testing)
 - c. Infectious disease (e.g., MRSA, *C. difficile* testing)
 - d. Oncology (e.g., BRAF mutation testing)
 - e. Rare/Undiagnosed Diseases
 - f. Pharmacogenomics
 - g. Prenatal/Neonatal Screening
 - h. Healthy Patient Screening

[THANK AND TERMINATE IF ONCOLOGY, RARE/UNDIAGNOSED DISEASES, PHARMACOGENOMICS, PRENATAL/NEONATAL SCREENING OR HEALTHY PATIENT SCREENING NOT SELECTED]

13. **[If (F) Selected in Q1]** Which of the following best describes your role?
- a. Administrator **[THANK AND TERMINATE]**
 - b. Director **[THANK AND TERMINATE]**
 - c. Manager **[THANK AND TERMINATE]**
 - d. Supervisor **[THANK AND TERMINATE]**
 - e. Vice President
 - f. C-Suite Executive
 - g. Other **[THANK AND TERMINATE]**

14. **[If (C) Selected in Q1 OR (F) Selected in Q13]** Which of the following best describes your title?
- a. Chief Informatics Officer
 - b. Chief Medical Informatics Officer/Chief Clinical Informatics Officer
 - c. Chief Medical Officer
 - d. Chief Nursing Informatics Officer **[THANK AND TERMINATE]**
 - e. Chief Executive Officer **[THANK AND TERMINATE]**
 - f. Chief Financial Officer **[THANK AND TERMINATE]**
 - g. Other **[THANK AND TERMINATE]**

15. **[If (A) Selected in Q14]** Which of the following degrees do you hold? Select all that apply.
- a. MD
 - b. PhD
 - c. MBA
 - d. Other Master's
 - e. Bachelor's
 - f. Other (please specify)

[THANK AND TERMINATE IF (A) SELECTED IN Q14 AND (A) NOT SELECTED IN Q15]

16. **[If (C) or (F) Selected in Q1]** What responsibilities fall under your purview? Select all that apply.
- a. Selecting enterprise healthcare technology for health system
 - b. Ensuring reliability, scalability, and affordability of IT infrastructure
 - c. Optimizing quality, safety, and efficiency in clinician workflows
 - d. Establishing clinician consensus for decision support rules
 - e. Supporting regulatory compliance and privacy protections
 - f. Integrating genomic data into medical records
 - g. Implementing telehealth solutions

[THANK AND TERMINATE IF (F) NOT SELECTED]

17. **[If (C) or (F) Selected in Q1]** Which of the following best describes your involvement in technology purchasing decisions?
- a. I am the sole decision-maker
 - b. I make the decision jointly with my colleagues
 - c. I am a member of a committee that makes the decision
 - d. I understand how the decision is made but am not part of the process **[THANK AND TERMINATE]**
 - e. I am not part of nor have visibility into the decision-making process **[THANK AND TERMINATE]**

18. Which of the following best describes the integration of genomic data into your organization's EHR?
- a. Genomic data is scanned or uploaded in PDF form to a patient's EHR record
 - b. The EHR has specific structured data fields for genomic data; these fields must be manually populated

- c. The EHR has specific structured data fields for genomic data; these fields are automatically populated
 - d. I don't know **[THANK AND TERMINATE]**
19. Which of the following best describes your involvement in your organization's personalized medicine initiatives?
- a. I spearhead personalized medicine initiatives
 - b. I am a member of a committee that oversees personalized medicine initiatives
 - c. I am well aware of my organization's personalized medicine initiatives across therapeutic areas, but am not directly involved
 - d. I am only somewhat aware of my organization's personalized medicine initiatives and am not directly involved **[THANK AND TERMINATE]**
 - e. I am neither aware of nor involved in my organization's personalized medicine initiatives **[THANK AND TERMINATE]**