Meet&Match.Dx 2022 Challenge #1

Title of the challenge: Non-invasive tools to measure nutrient status in children and adults

Name of the Pharma/Medtech company: Abbott

Disease area (optional): Nutrient deficiencies and/or Malnutrition

Description of the challenge:

1. Short introduction about the disease or the problem.
Malnutrition affects 1 in 3 people globally and has been exacerbated by the COVID-19 pandemic. Globally, more than 460 million adults are undernourished, and malnutrition affects many children under the age of 5 resulting in 149 million that are stunted, 45 million that are below a healthy weight and 39 million that are overweight or obese. In addition, nutrient insufficiencies/ deficiencies during pregnancy have a negative impact on health of both the woman and the child who can develop stunting, failure to thrive, and cognitive impairment. Picky eating in children is also a problem since this can lead to children eating foods with low nutritional value but with high calorie, leading to development of obesity and nutrient deficiencies. Currently there is a lack of easy to use, non-invasive, early detection tools to identify nutrient deficiencies in these vulnerable populations. Early identification of nutrient insufficiencies/ deficiencies could lead to targeted nutrition intervention which could prevent the onset of malnutrition.

2. Describe the current treatment/solution and its limitations.
Currently for children, the mid-upper arm circumference (MUAC) z-score tape is used to get anthropometric values tied to risk of malnutrition. In adults, validated questionnaires are used to identify risk of malnutrition. However, the drawback with these tools is that they do not specifically identify which particular nutrient is insufficient/ deficient. In both adults and children, blood-based biomarkers can be used to measure specific nutrient levels (e.g., vitamins, minerals, protein adequacy). The disadvantage is that these are invasive and not feasible for routine testing in children (especially if repeated measures are needed). Other metabolomic biomarkers are being developed but current analytical cost is very high.

3.1. Describe which kind of solution you are looking for:
Looking for rapid and cost-effective screening tools that can non-invasively identify key nutrient deficiencies/insufficiencies in children and adults, linked to a digital system that can be tied to nutritional recommendations. If possible, a panel of markers to detect multiple nutrients simultaneously would be desirable.

Desirable solutions:

- Non-invasive tests that can measure nutrients in non-blood biological samples (e.g., urine, saliva, sweat, hair, others).
- Testing can be done on-site (doctors office) or by consumer at home.

- Test should be rapid, easy to use, and could just indicate if person has nutrient deficiency/insufficiency vs not.
- Preference would be for an instant read-out (rapid diagnostic) test, similar to current over the counter covid tests or pregnancy tests. Tests that require sample analysis in core lab are not preferred, but could be considered if other options do not exist. Additionally, preference would be given to tests that have good validation to the standard blood tests available for the nutrients.
- Priority would be given to rapid tests that can be linked to a digital reporting system that can then be tied to recommendations for treatment/ management.
- Global markets will be considered with preference for developing countries where undernutrition is highly prevalent (thus low-cost tests desirable).
- Nice to have would be if the test could measure multiple nutrients simultaneously.
- Examples of key nutrients of interest include measuring protein inadequacy, vitamins (Vitamin D, Vitamin A, Vitamin B12, etc.), minerals (Iron, Folate, Zinc), anemia etc.

4. Target group:

Health care professionals (Doctors, nurses, dieticians etc.), at home consumers/ caregivers, non-government organizations (NGOs) and social workers.