Innovative Methodologies and Technologies: The PREDICT Programme

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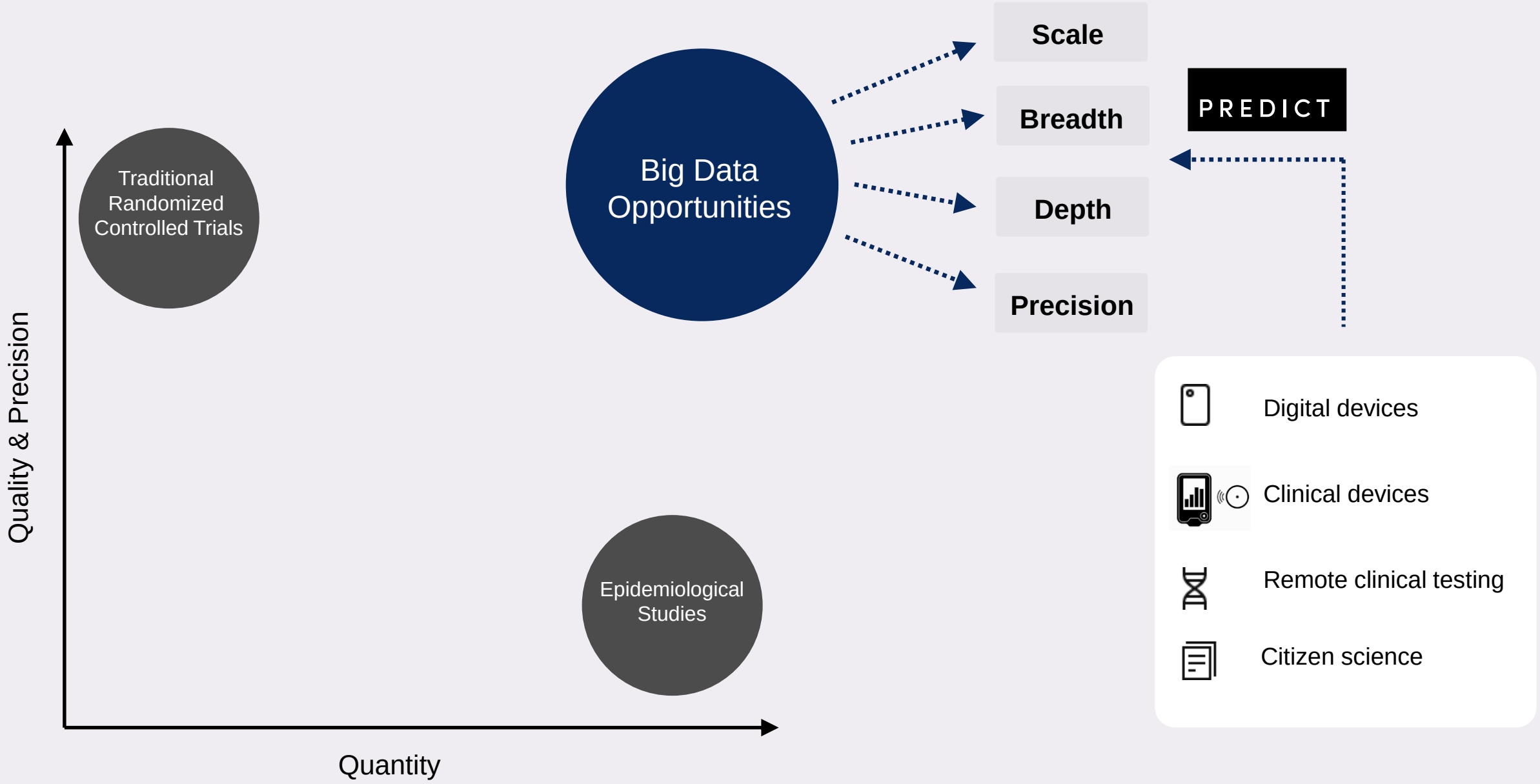
PREDICT within the current nutrition landscape – big data and novel technologies



PREDICT

Largest ongoing program to measure Individual responses to food in nutritional science

King's College London

Massachusetts General Hospital

Stanford University

Harvard Medical School

Tufts University

ZOE

Nutrition academia + Tech companies

PREDICT 1

PREDICT 1

n=1,100

Healthy
60% TwinsUK

Clinic & Home
(UK/US)

Postprandial
responses

Jun 2018 - May 2019

STATUS:
Complete

PREDICT - Carbs

n=100

Healthy Compliant
individuals from
PREDICT 1

Home (UK)

Postprandial
responses
Meal order
Time of day

Jan 2019 - May 2019

STATUS:
Complete

PREDICT 1 Plus

n=900

Healthy
TwinsUK

Clinic & Home
(UK)

Continuation of
PREDICT 1
Postprandial
responses

Jun 2019 - Ongoing

STATUS:
n=250

PREDICT - Cardio

n=50

High/Low CVD
risk subset of
PREDICT 1 Plus

Clinic & Home
(UK)

Cardiometabolic
end-points
Liver fat
Vascular function

Sep 2019 - Ongoing

STATUS:
Complete

PREDICT 2

n=1,000

Healthy
Ethnicity

Home (US)

Validation of remote
study delivery
Postprandial responses
Microbiome profiling

Jun 2019 – Mar 2020

STATUS:
Complete

PREDICT 3

n=30,000

Healthy
Ethnicity
Chronic disease

Home (US)

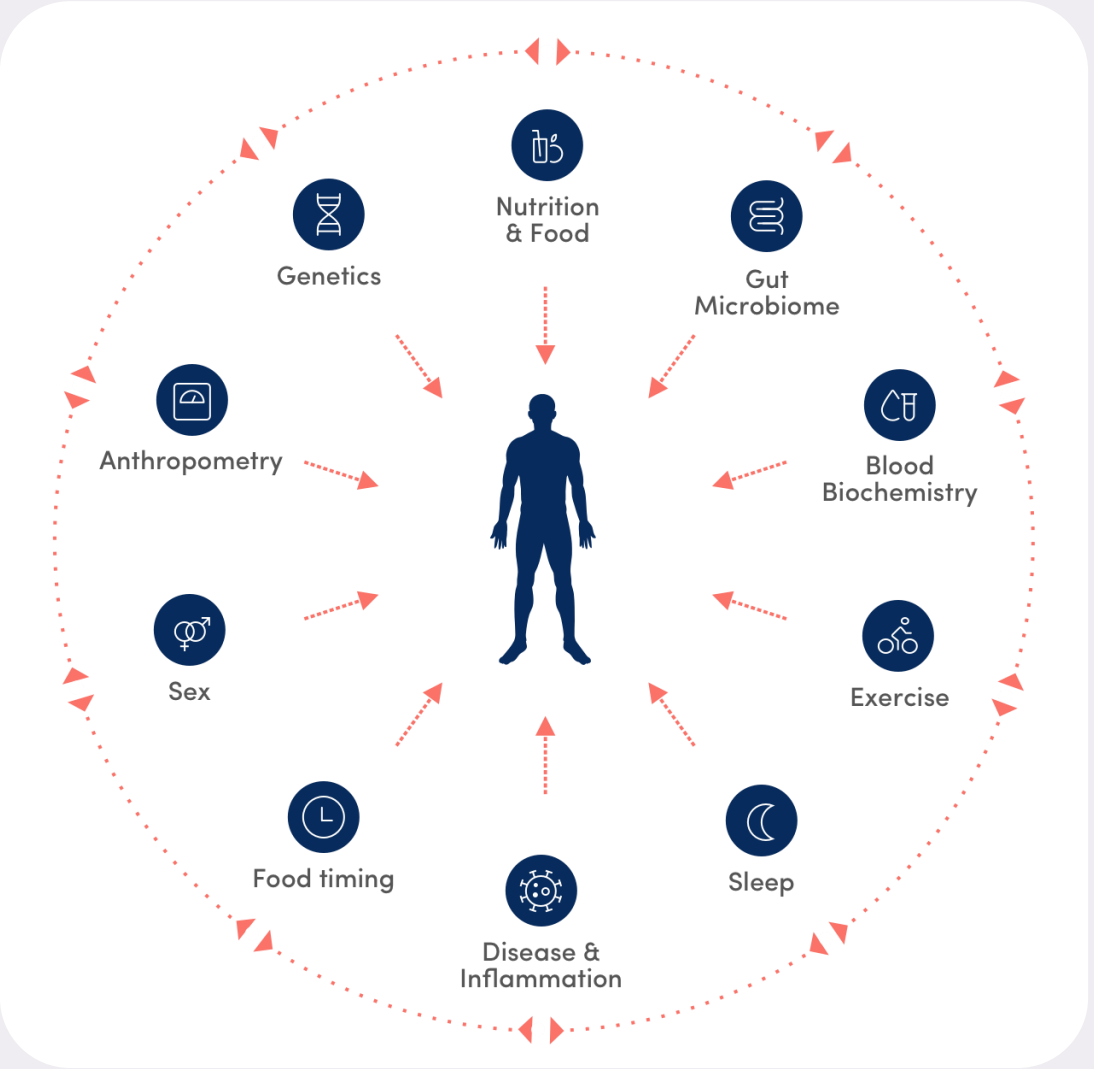
Postprandial responses
Dietary assessment
Microbiome profiling

July 2020

STATUS:
n=5,000

https://joinzoe.com/

The PREDICT programme measures the **integrated** response and interrelated **multi-directional** pathways



PREDICT 1

Main Cohort n=1,002

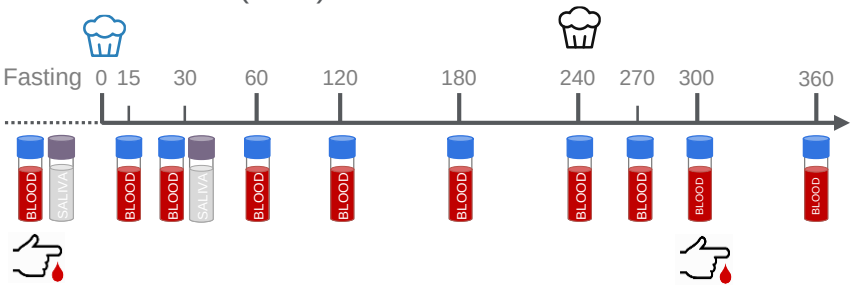
Validation Cohort n=100

Aims

Use genetic, metabolomic, metagenomic and meal-context information to predict individuals' postprandial responses to food.

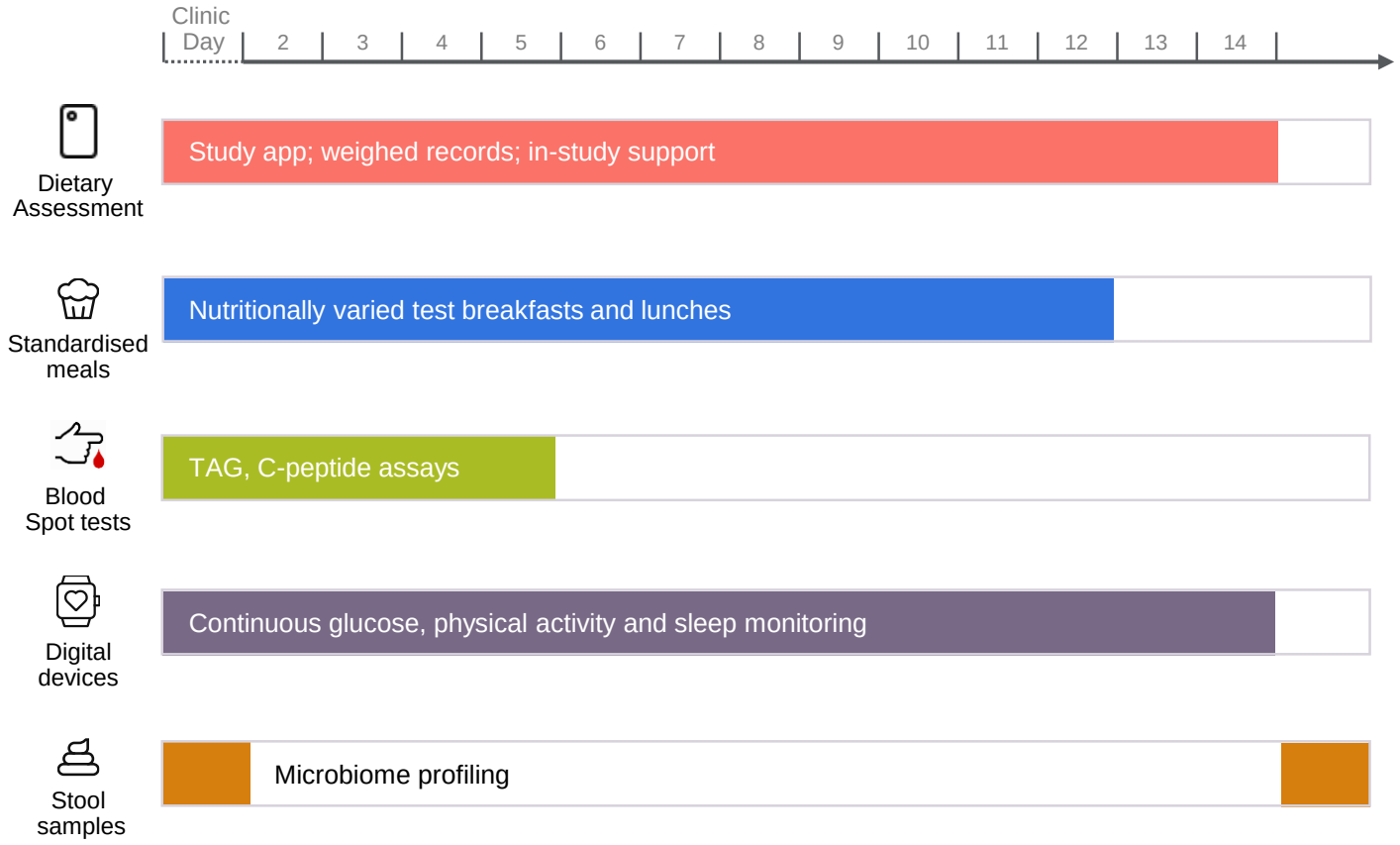
Baseline Clinic Visit (Day 1)

Controlled Time (Mins)



- Metabolic challenge: Other test meals
- Genetics, Clinical assays & Metabolomics
- Metabolomics, Saliva & Urine
- Blood pressure and heart rate
- Anthropometry: DEXA, waist/hip & BMI
- Questionnaires: FFQ, Lifestyle & Medical

Home Phase (Days 2-14)

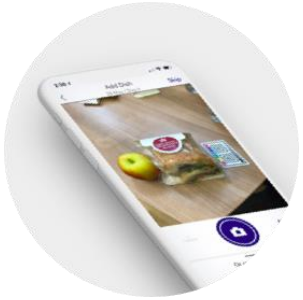


Jun 2018 – May 2019 IRAS 236407 IRB 2018P002078 NCT03479866

PREDICT 1

The scale of the PREDICT 1 study data

32,000
Muffins consumed



132,000
Meals logged

750,000
Metabolomic measures

2,022,000
CGM glucose readings

28,000
TAG readings

75 billion
Metagenomic reads

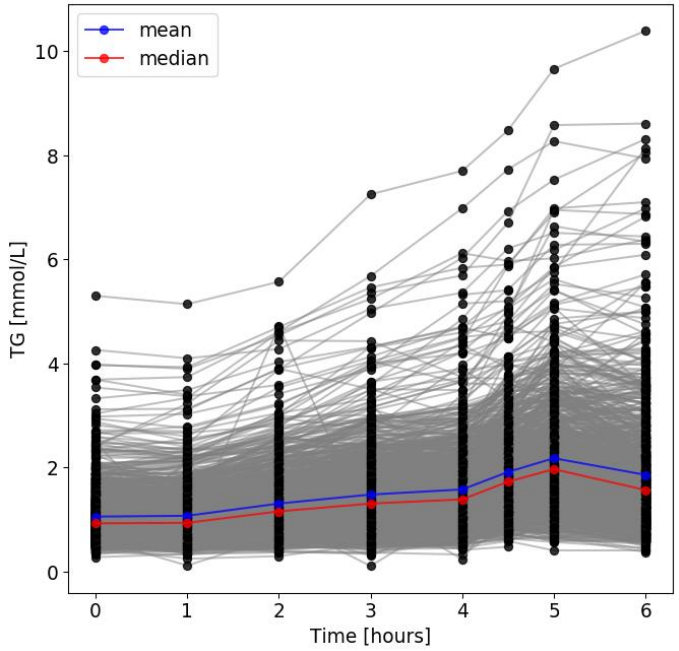
PREDICT 1

Significant variability between healthy individuals

ARTICLES
https://doi.org/10.1038/s41591-020-0934-0
nature medicine
Check for updates

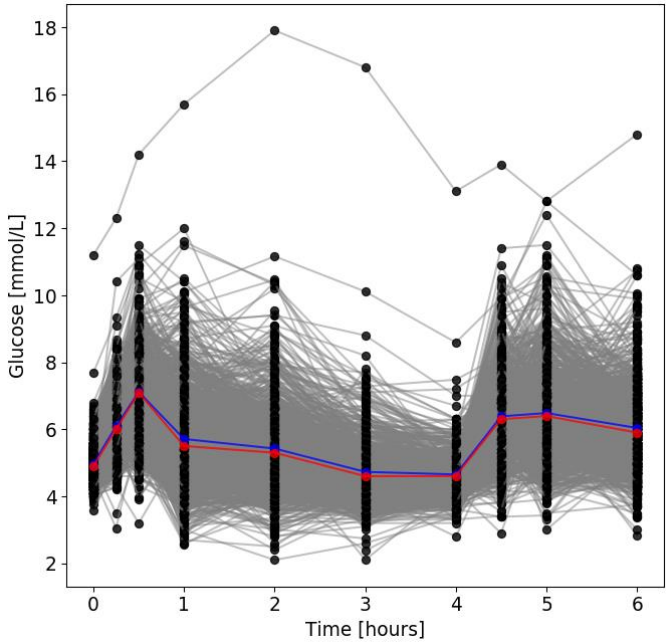
Human postprandial responses to food and potential for precision nutrition

Triacylglycerol



	Baseline	6h rise
CV	50%	103%

Glucose



	Baseline	2h iAUC
CV	10%	68%

Clinic day data, n = 1,002

PREDICT 1

What are the multiple determinants and how do they impact outcomes?

What we eat

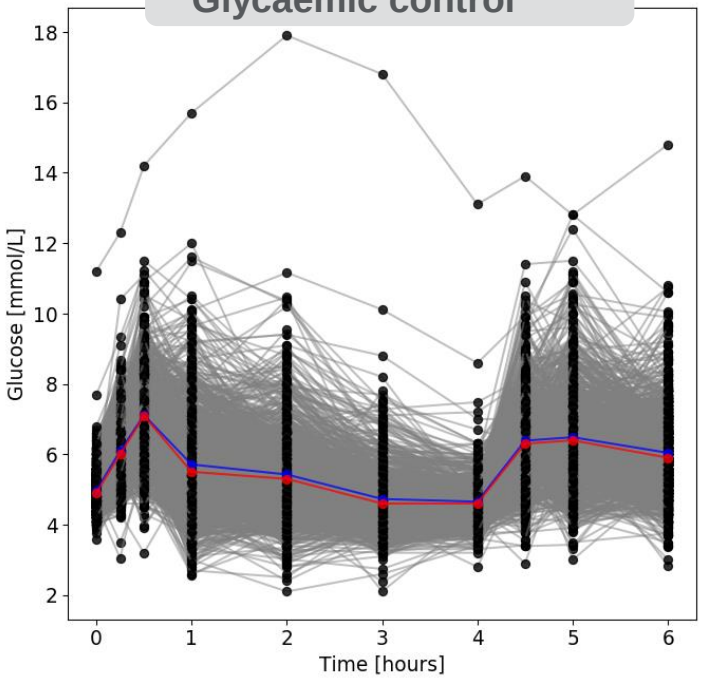
How we eat

Who we are

Exposure

- Meal composition
- **Meal context** Time of day, Meal sequence, Exercise, Sleep
- Genetics
- Microbiome
- Age & Sex
- Blood pressure
- Serum measures
- Anthropometry
- Habitual diet

Glycaemic control



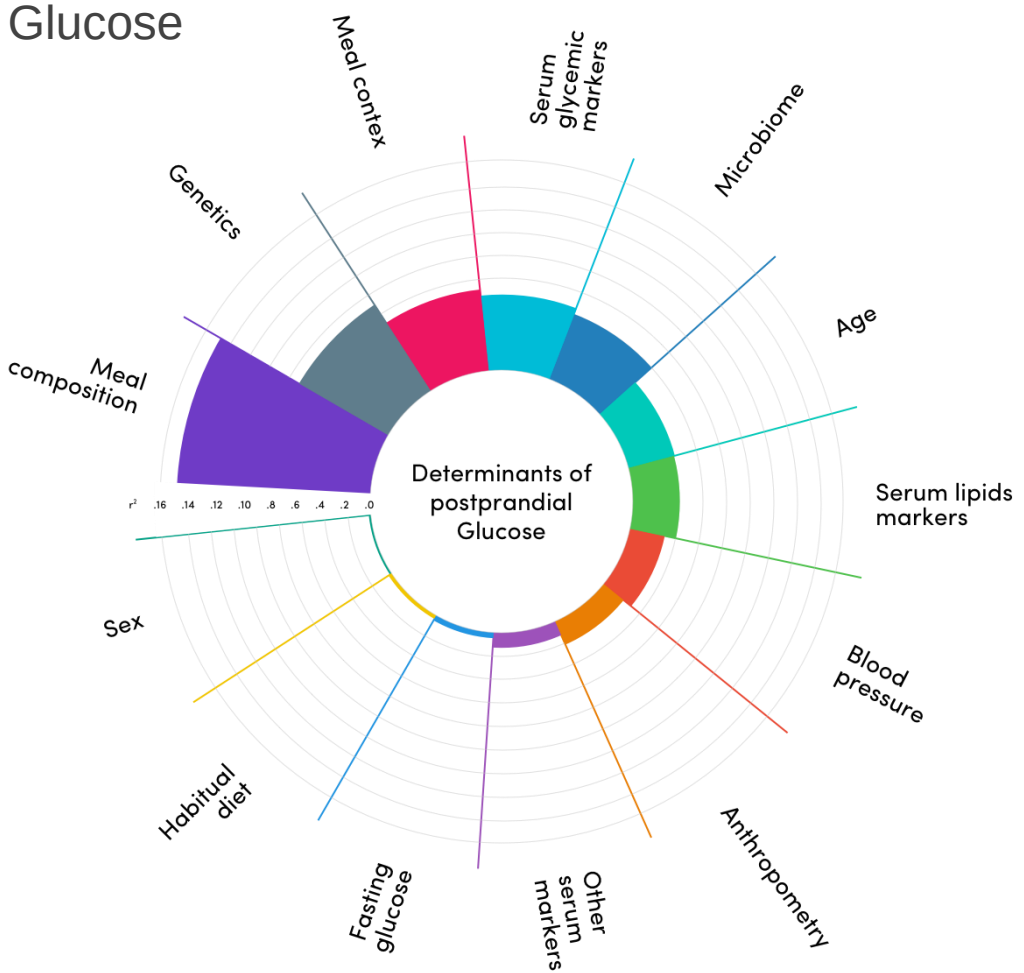
Outcome

- Metabolomics
- Microbiome
- Glycaemic control
- Inflammation
- Serum measures
- Anthropometry
- Endothelial dysfunction
- Hunger & energy intake

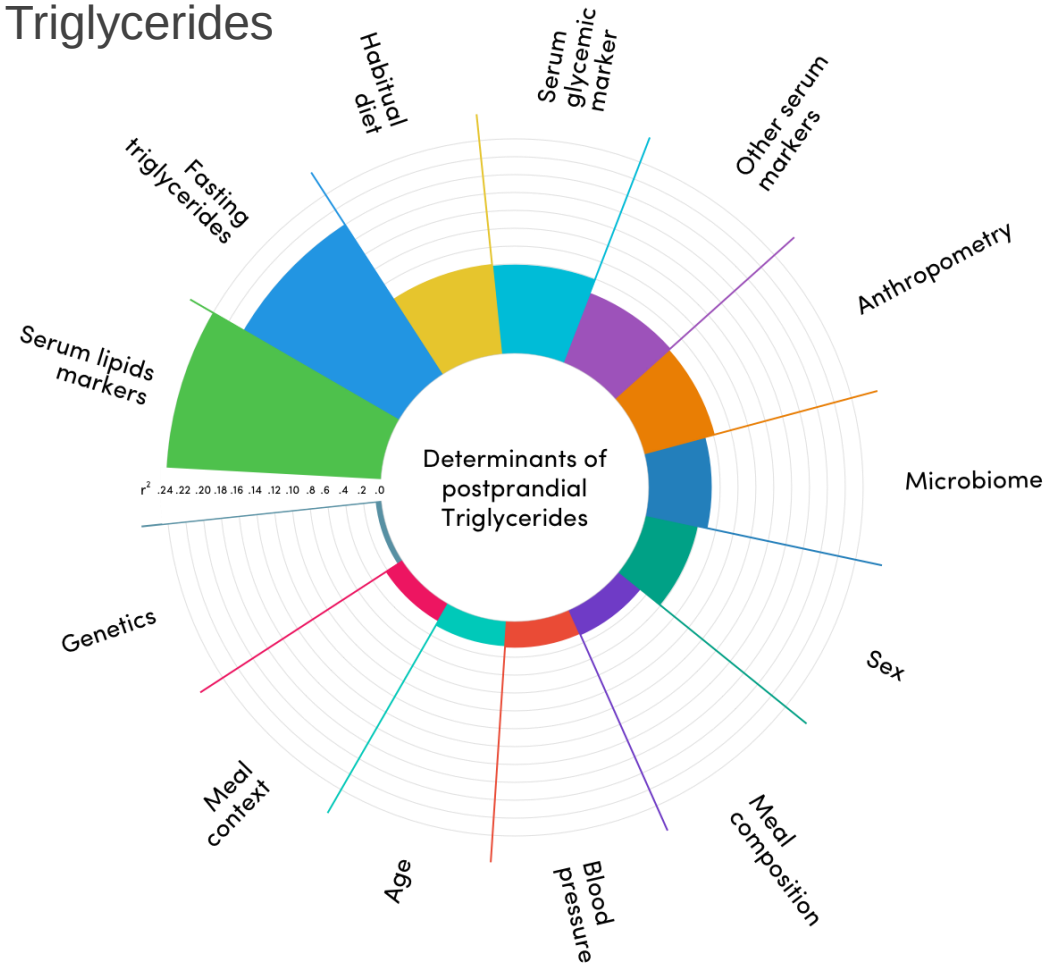
PREDICT 1

The determinants differ for different outcomes

Glucose



Triglycerides

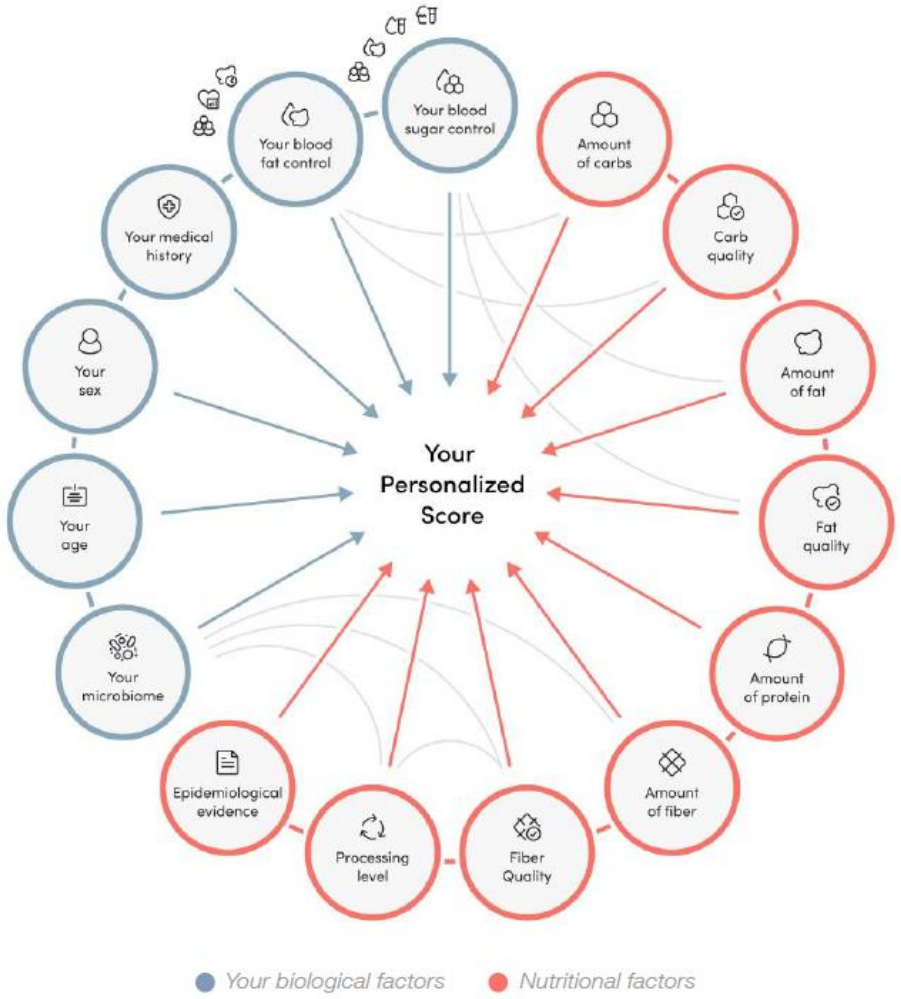


PREDICT 1

How can this translate to a real life setting/ dietary advice?

Individual takes test

Machine Learning model uses test results to predict responses to new meals



PREDICT 1

Diet-health-microbiome signature; Personalized gut ‘boosters’ and ‘suppressors’

nature medicine ARTICLES
https://doi.org/10.1038/s41591-020-01183-8
Check for updates

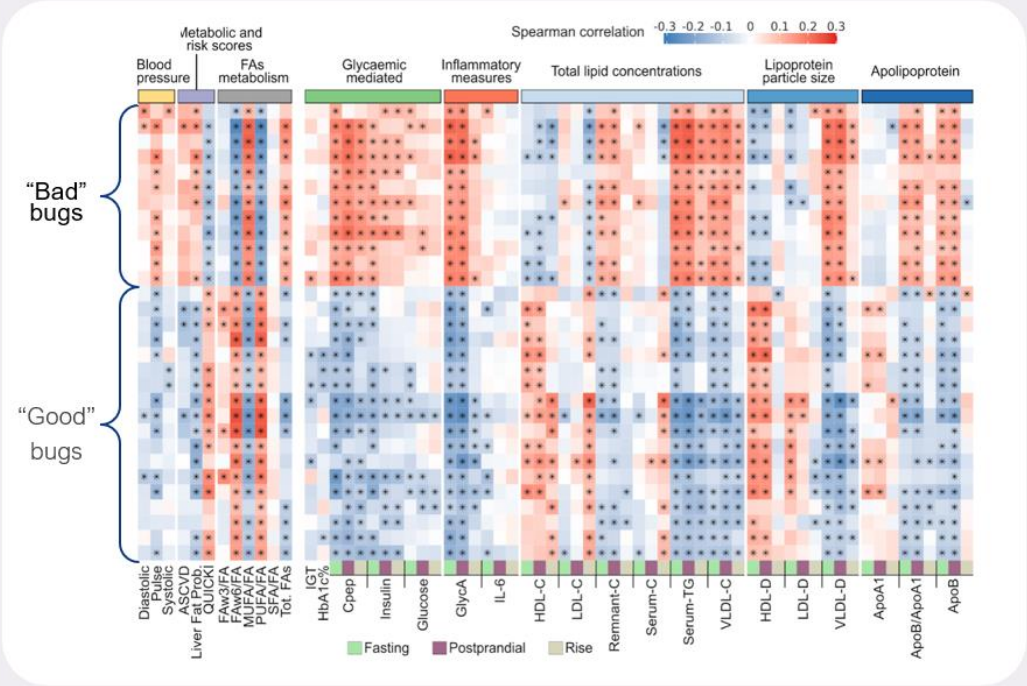
Microbiome connections with host metabolism and habitual diet from 1,098 deeply phenotyped individuals

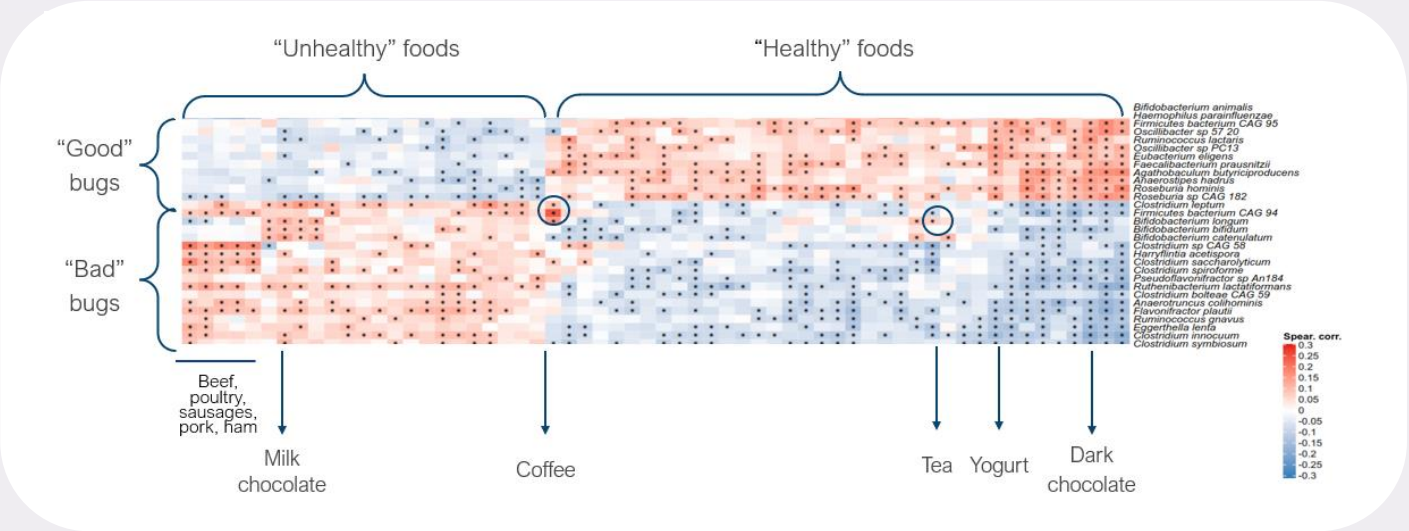
“Good” bugs

- *E. eligens*
- *B. animalis*
- *F. prausnitzii*
- *H. parainfluenzae*
- *Oscillibacter sp. 57 20*
- *Oscillibacter sp. PC13*
- *Firmicutes bacterium CAG:95*
- *Firmicutes bacterium CAG:170*
- *Roseburia sp. CAG:182*
- *Clostridium sp. CAG:167*
- *Romboutsia ilealis*
- *Veillonella atypica*
- *V. infantium*
- *V. dispar*
- *P. copri*

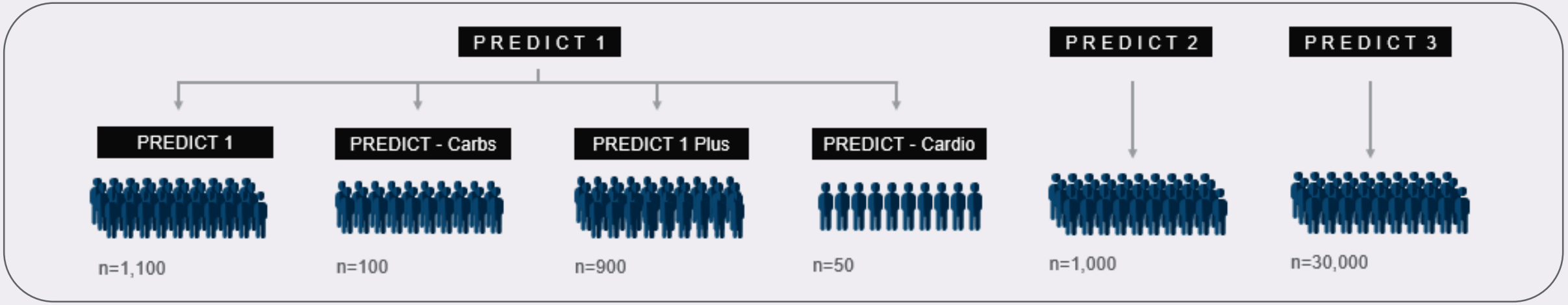
“Bad” bugs

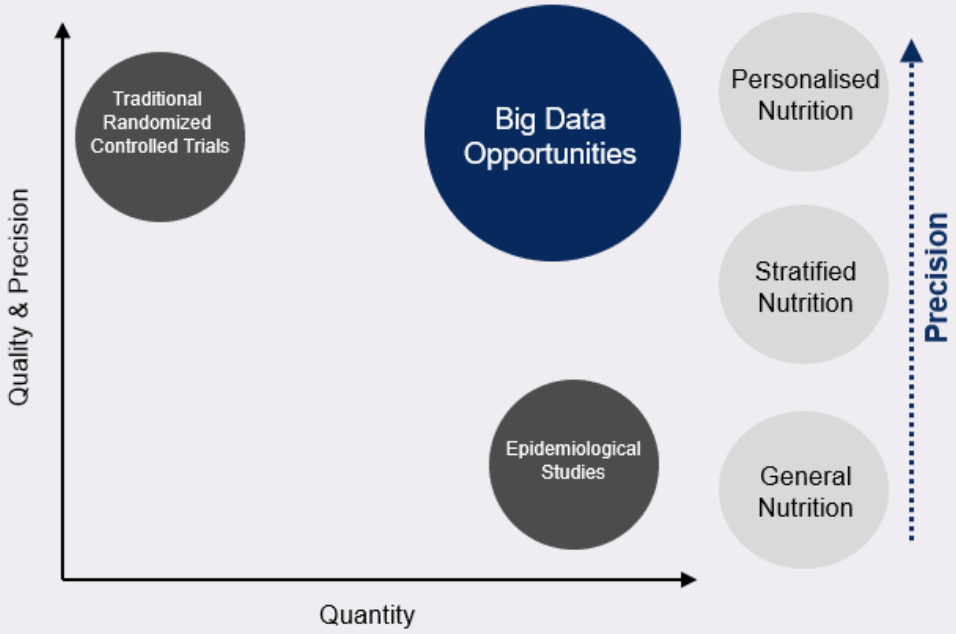
- *E. lenta*
- *C. leptum*
- *F. plautii*
- *C. bolteae*
- *Escherichia coli*
- *R. lactatiformans*
- *Collinsella intestinalis*
- *Blautia hydrogenotrophica*
- *Clostridium sp. CAG:58*
- *C. symbiosum*
- *C. bolteae CAG 59*
- *A. colihominis*
- *C. innocuum*
- *C. spiroforme*
- *R. gnavus*





The future for the ZOE PREDICT programme





The ZOE program

Phase 1: Test
Complete your tests

At home test including challenge muffins, microbiome test, blood fat tests, blood sugar sensor (if applicable) and food diary.

Phase 2: Learn
Get your insights

Learn how your unique body responds to foods including your dietary inflammation triggers and scores for your logged meals.

Phase 3: Retrain
Start your 4-week plan

Use your 4-week plan to apply these findings to your own life. You'll use the ZOE Insights app to reduce dietary inflammation levels and make smarter gut choices. Then receive your full personalized gut health report.

Phase 4: Thrive
An app that supports you

Build on your success and refine. Continue using the ZOE Insights app to achieve sustainable health & weight improvements with ZOE day scores and expert insights on your diet.

Thank you

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Conflict of interest

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Consultancy; ZOE Global

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