

The Elephant in the Room

Thoughts on Healthcare in the Digital Age
September 2018



FIRSTSTEP is a boutique innovation group helping innovation leaders tap-in to startup innovation to see the forces of disruption through a fresh lens.

The goal is to reduce disruption risk, increase agility and build alignment around where to place winning bets.

(and why)

EAT

MOVE

SLEEP

CHILL

LOVE

FOLLOW YOUR BLISS

...REPEAT



Lifestyle Medicine Clinic



*Out on the edges you see all kinds
of things you can't see from the center.*

*Big, undreamed-of-things...
the people on the edge see them first.*

--- Kurt Vonnegut ---

THE PROMISE



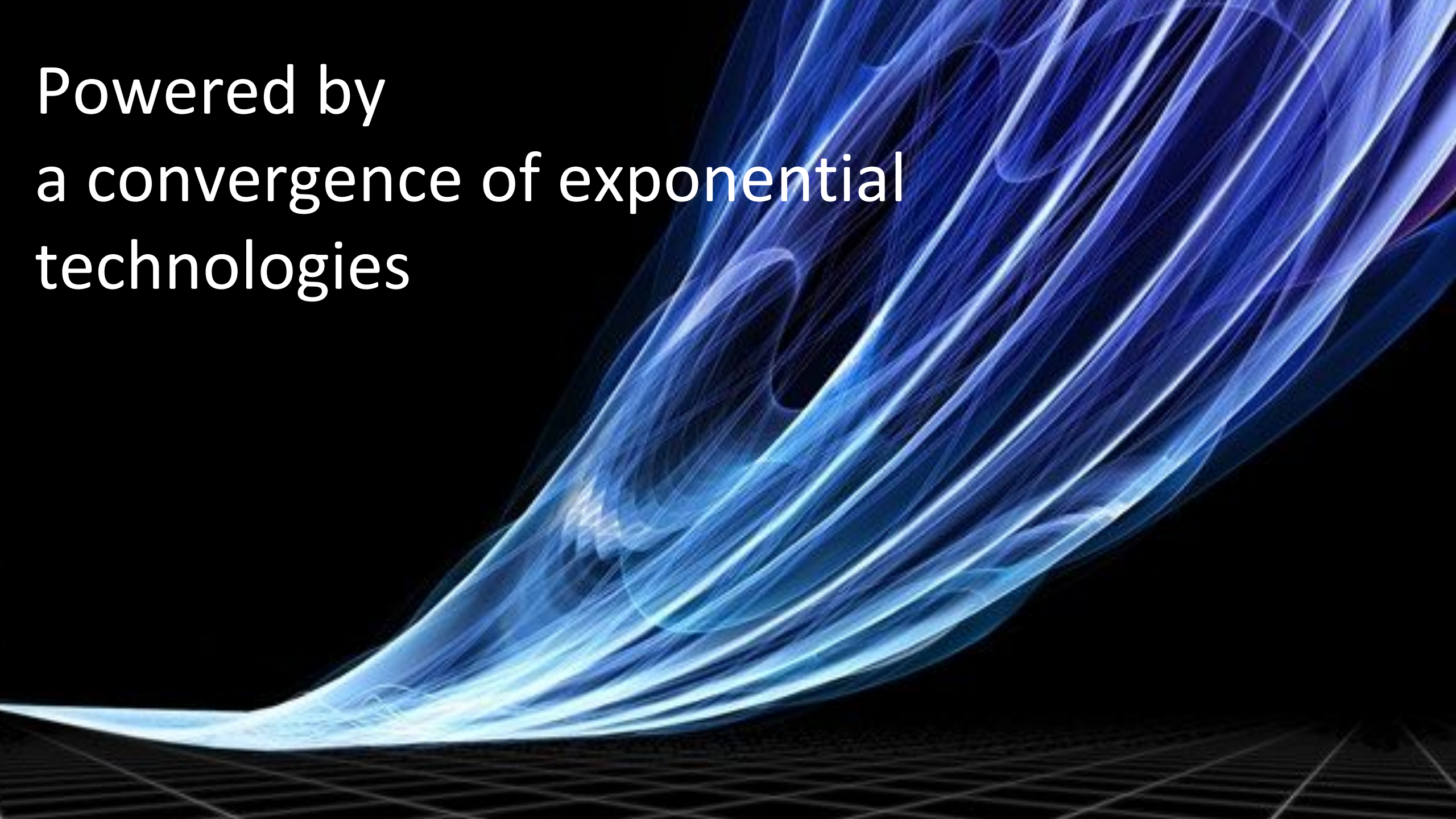
Everyone and Everything is Connected

....or soon to
be

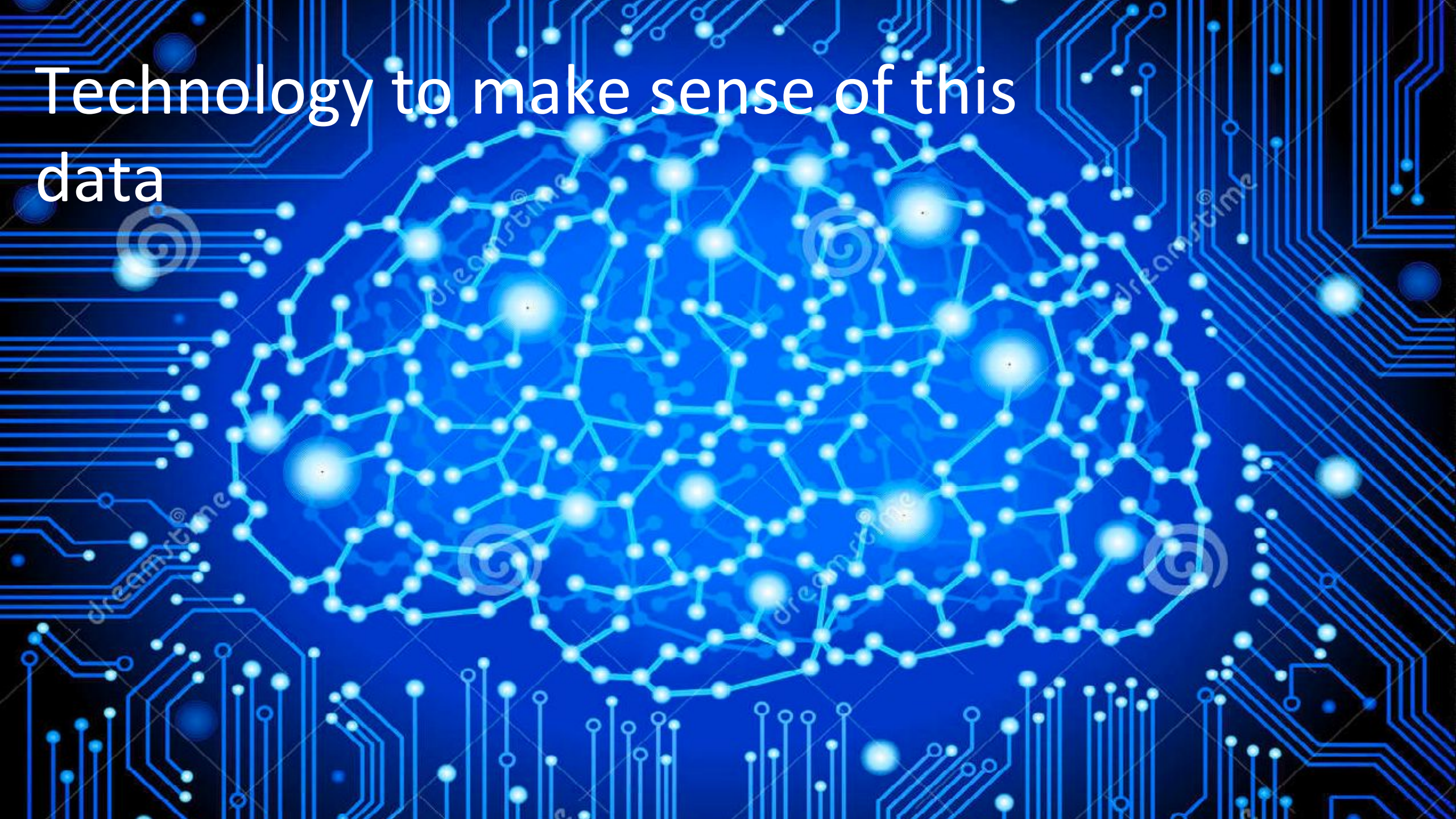
Everything is being digitized



Powered by
a convergence of exponential
technologies



Technology to make sense of this
data



and derive real
insight



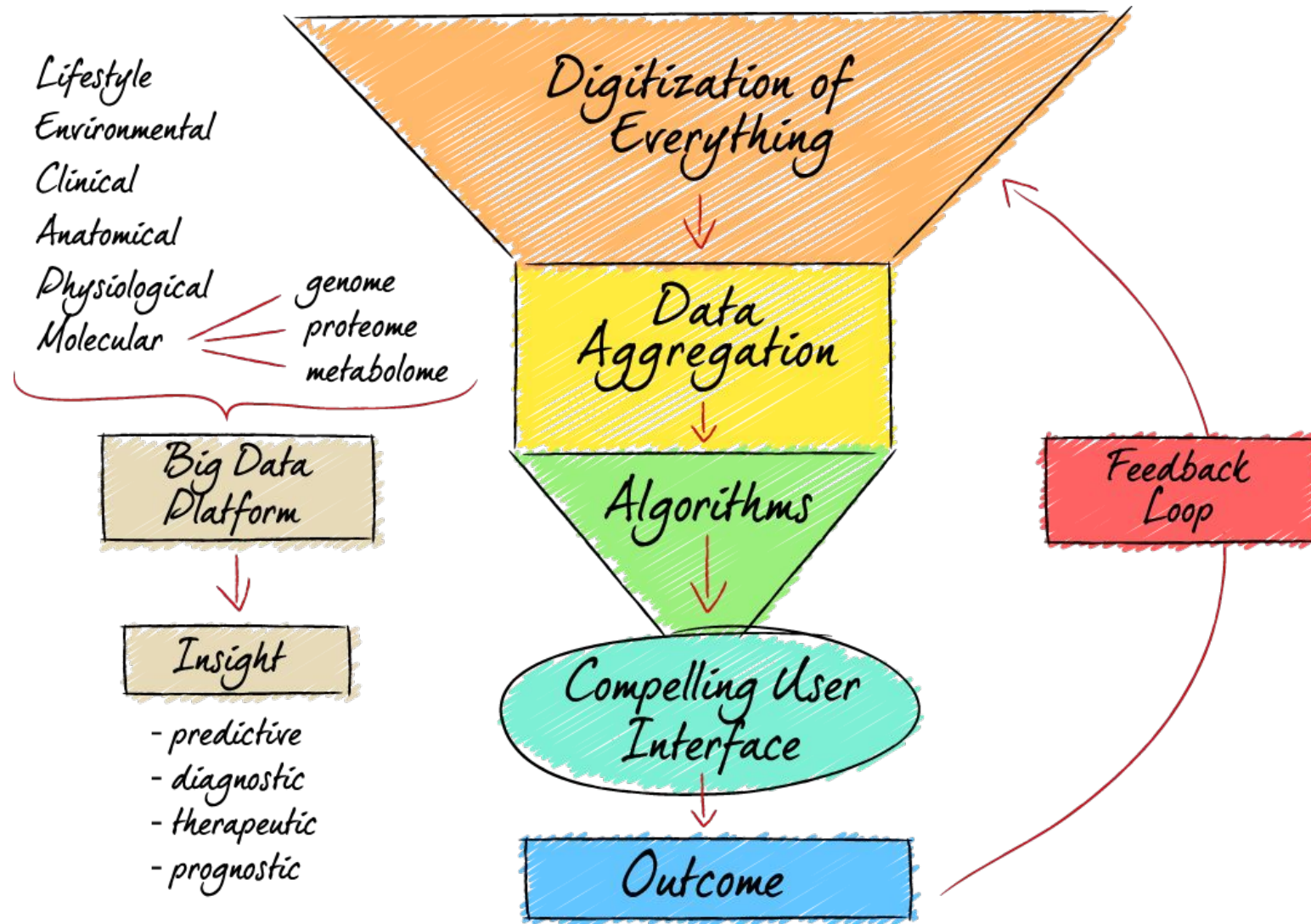
AN EDGE PERSPECTIVE

1st PRINCIPLES

First
Principles:

Emergence of Digital Health Stack

LEARNING ALGORITHMS USE MULTIPLE DATA SETS TO POWER INSIGHTS

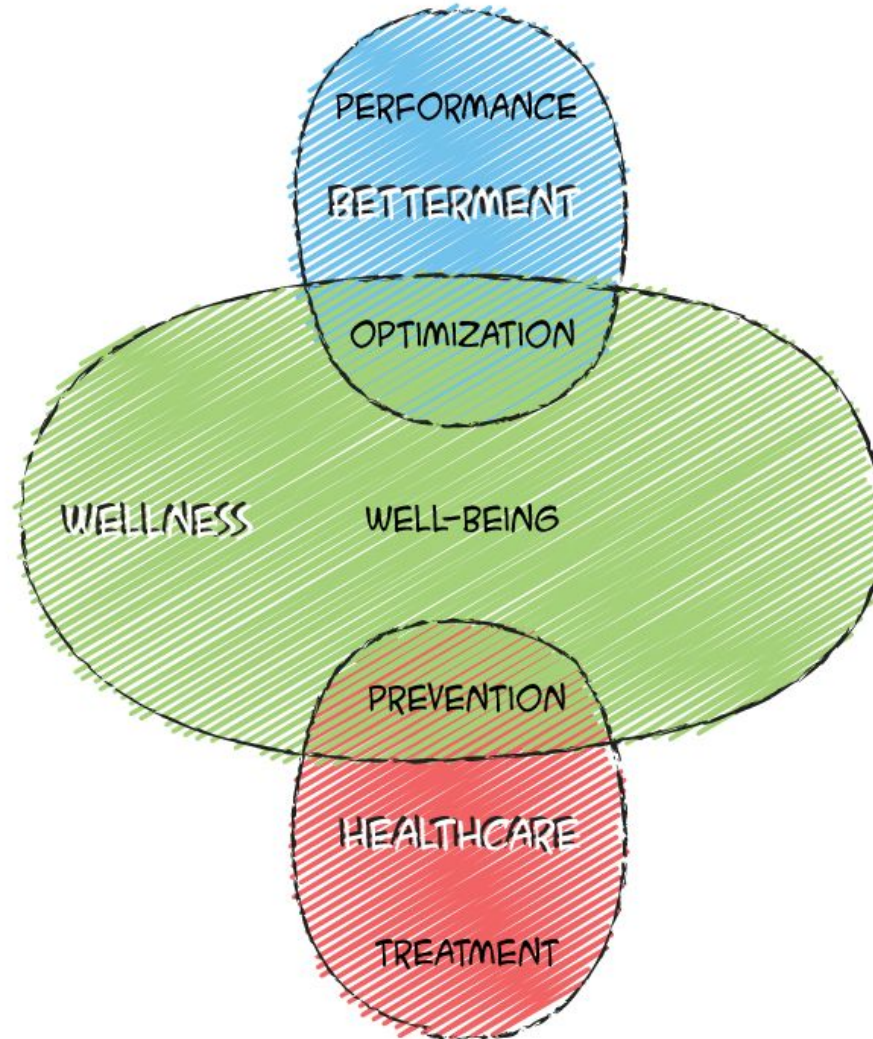


DIGITAL HEALTH STACK

First
Principles:

Health, Wellness & Betterment

Health is more than
the absence of
disease...

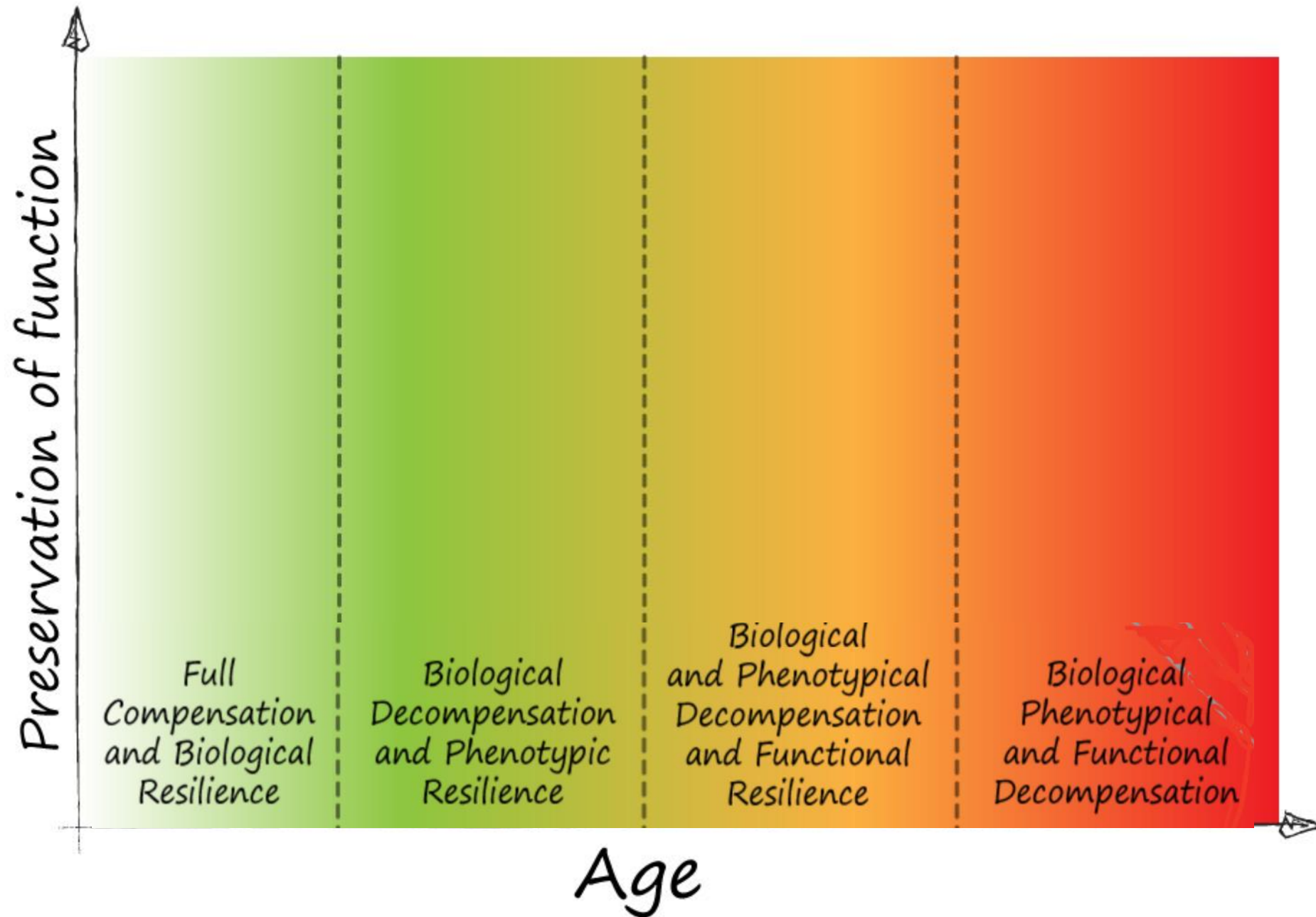


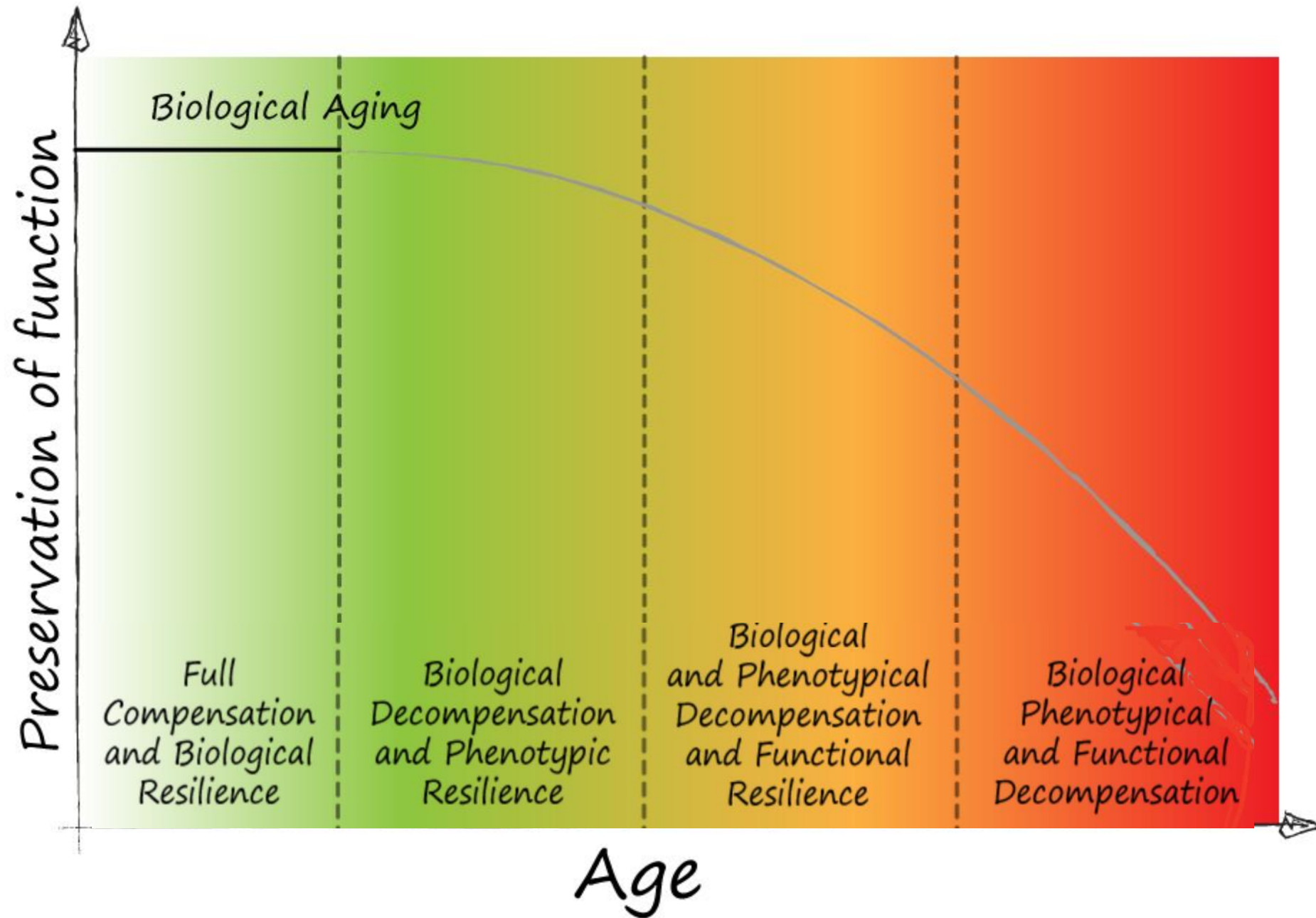
...it is a state of
complete physical,
mental and social
well-being

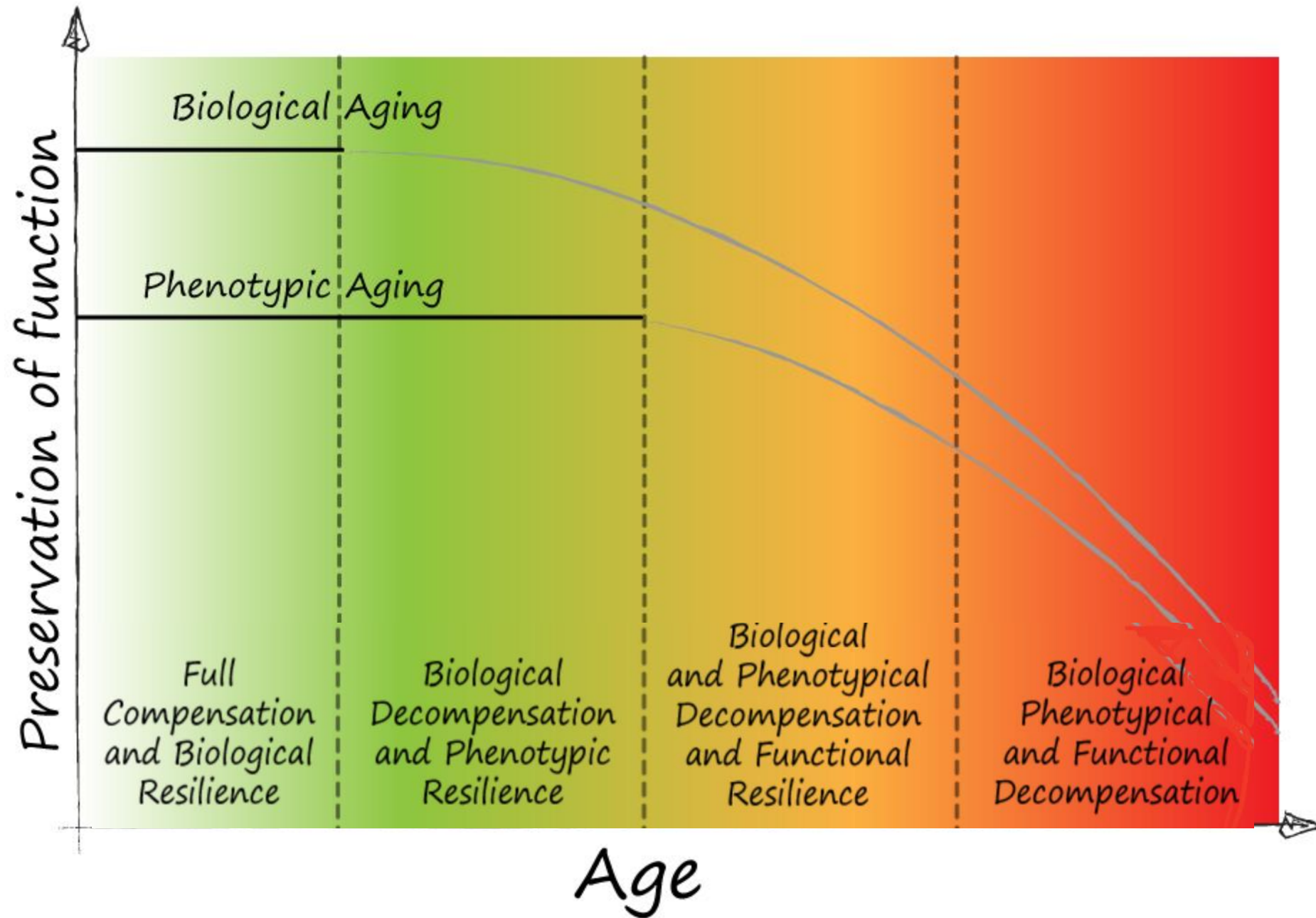


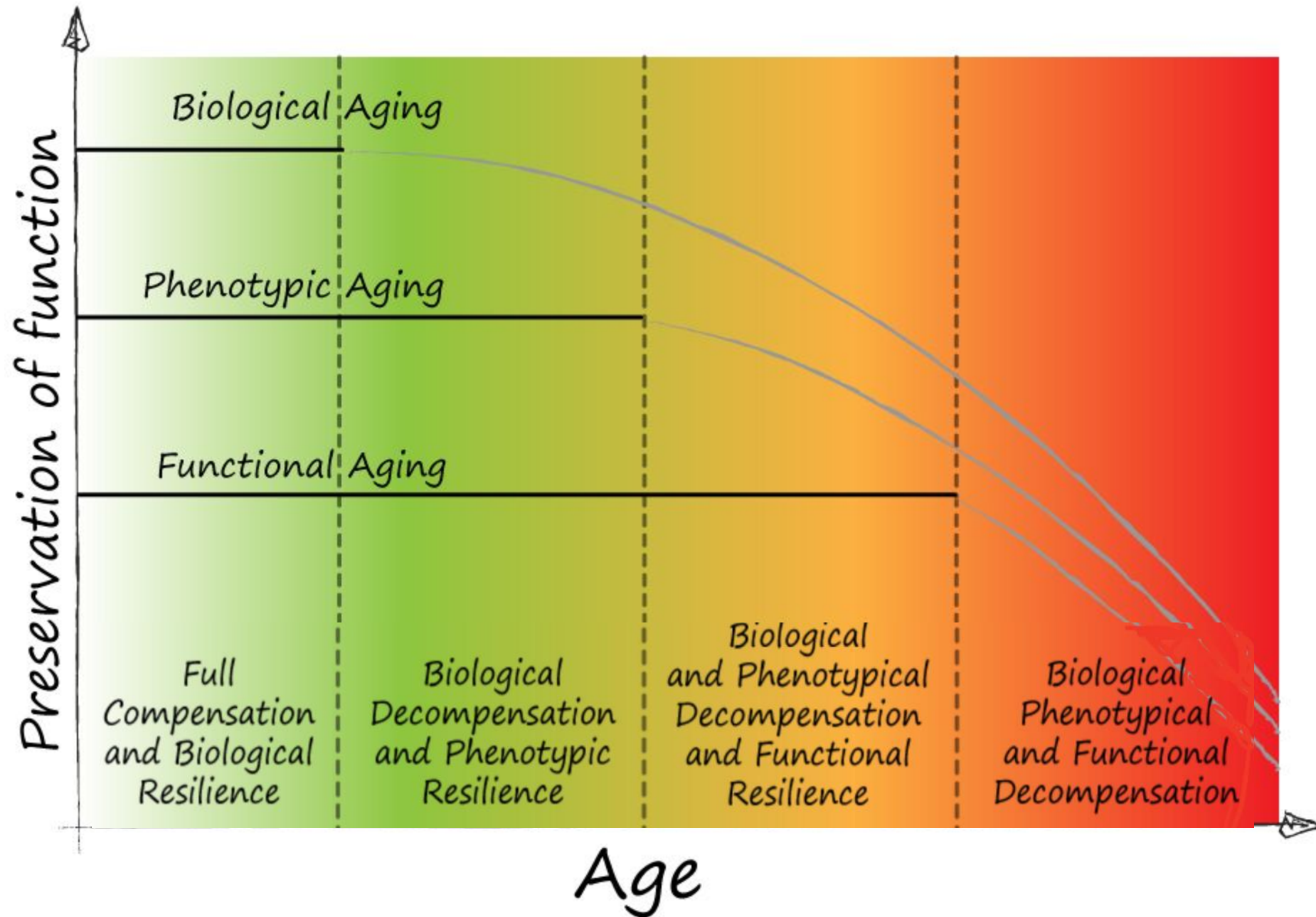
Wh
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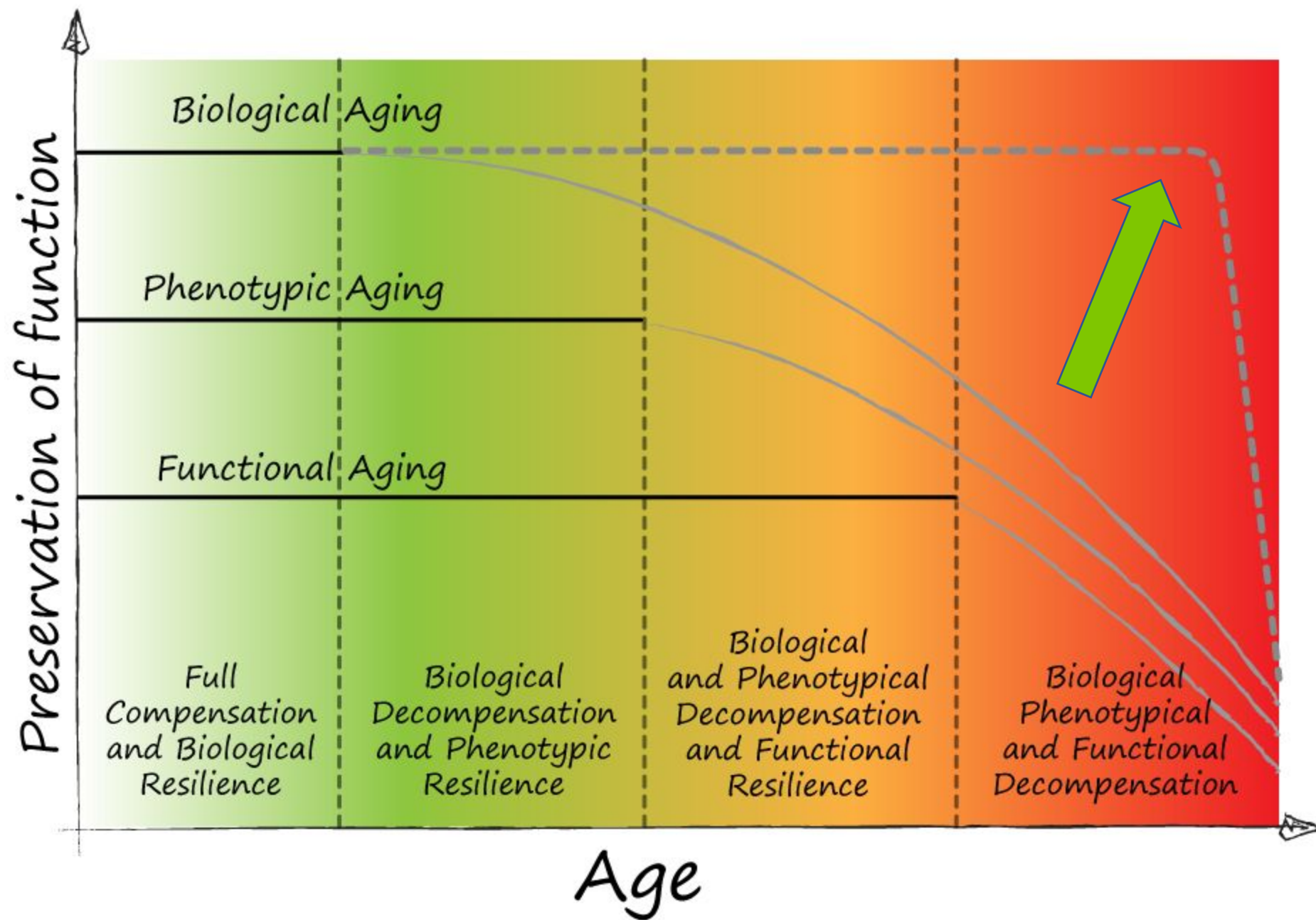




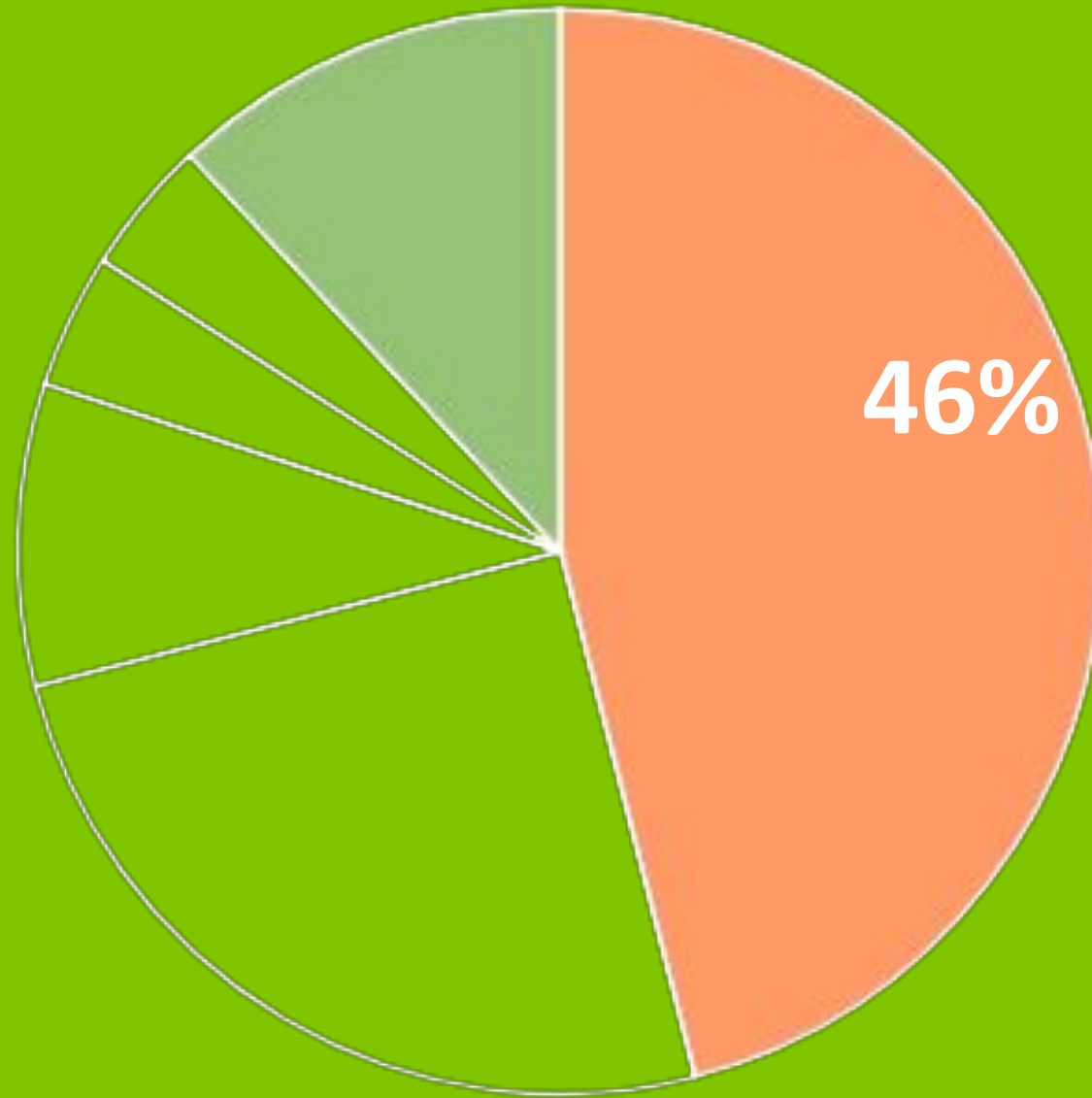








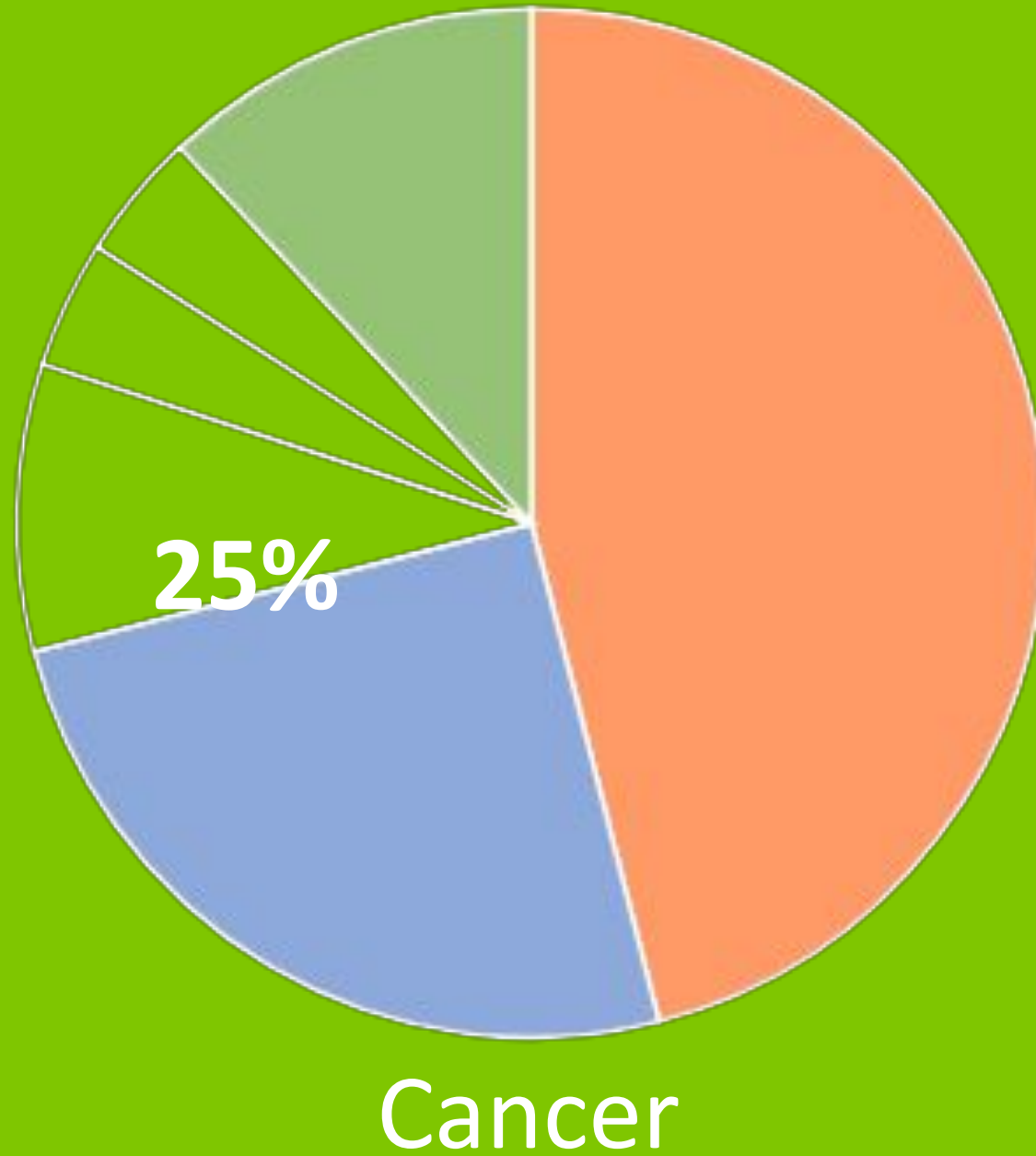
Why we die?



Cardiovascular Disease

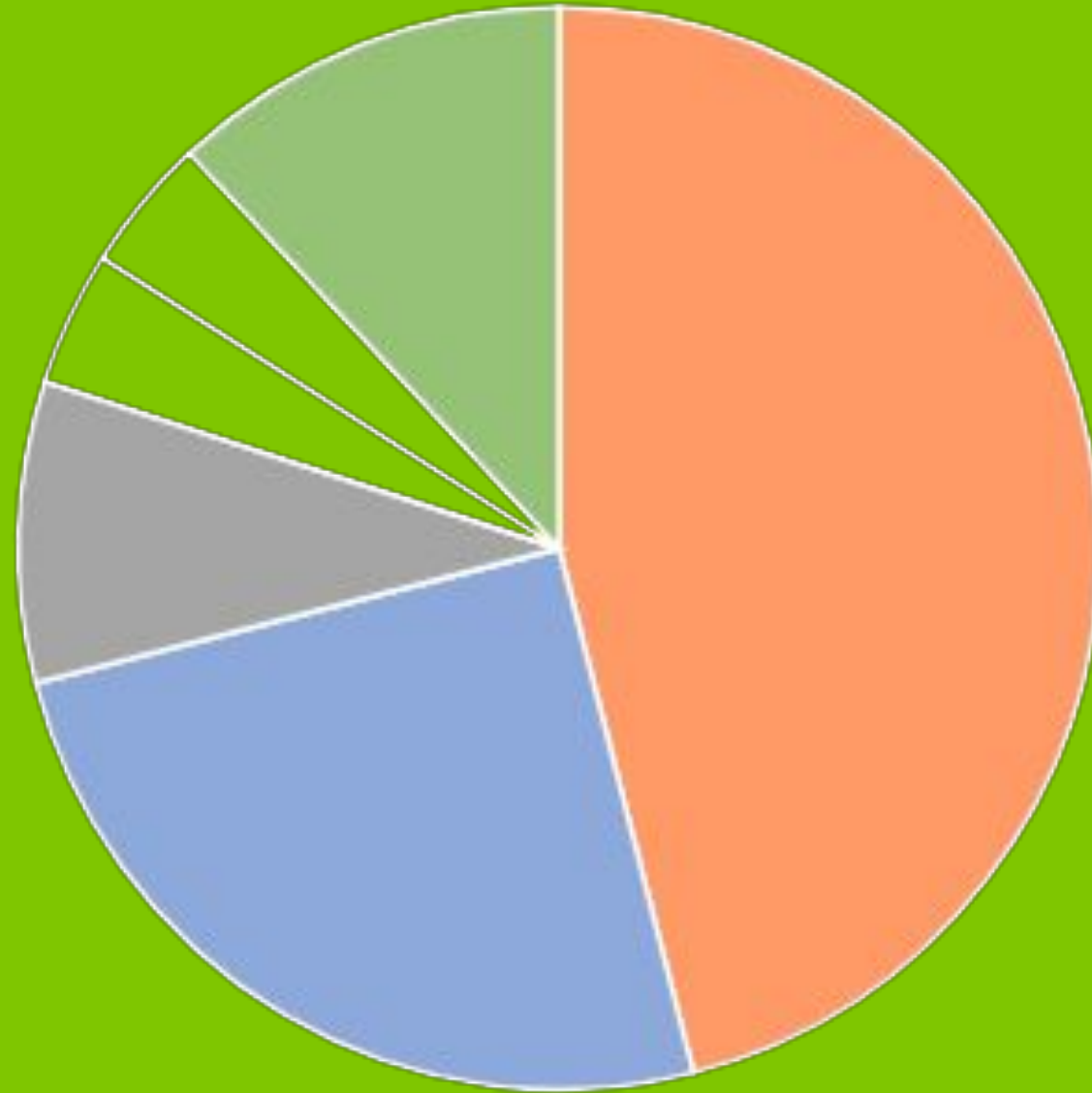


Why we die?



Why we die?

9%

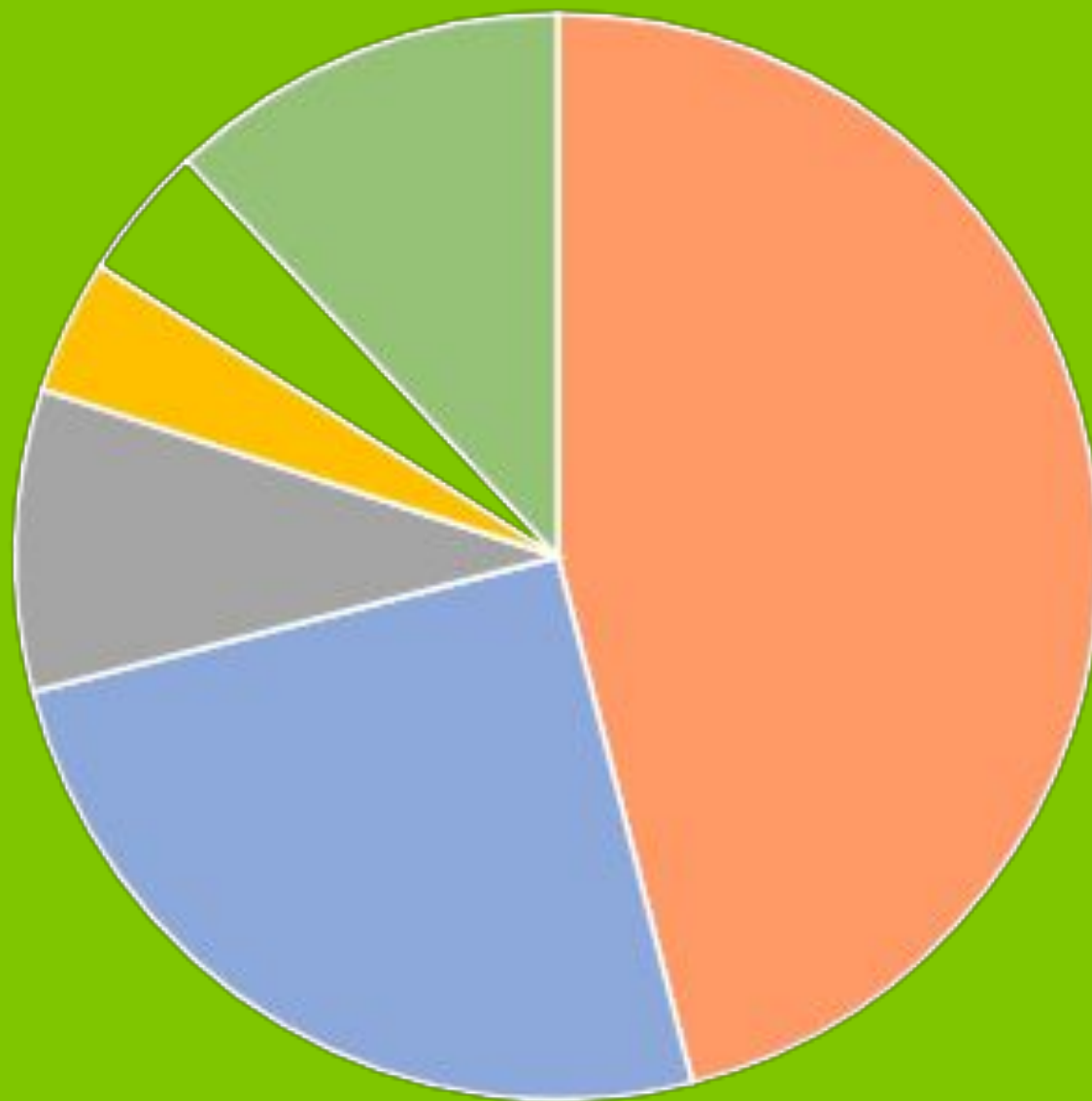


Neurodegenerative Disease



Why we die?

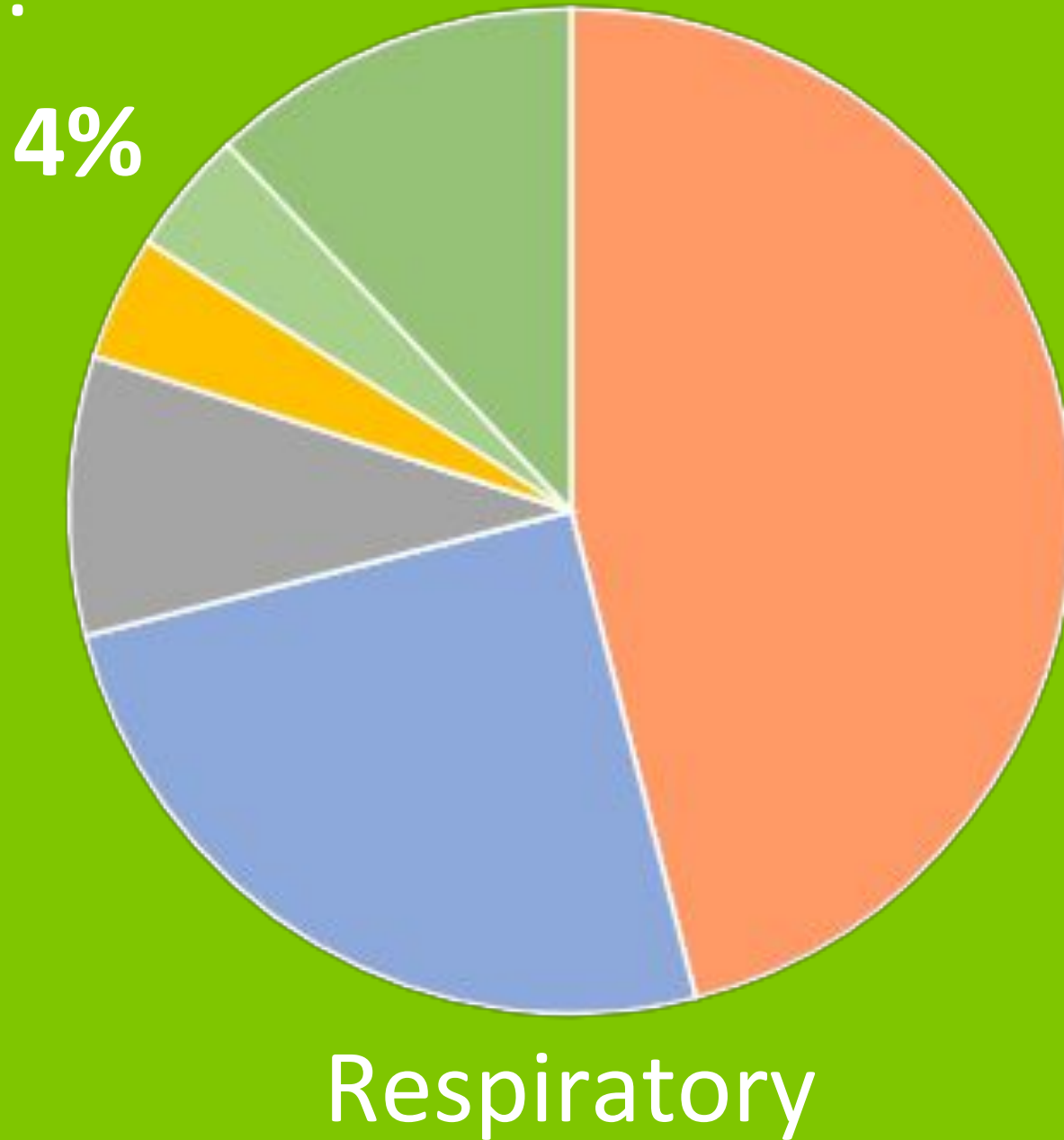
4%



Diabetes

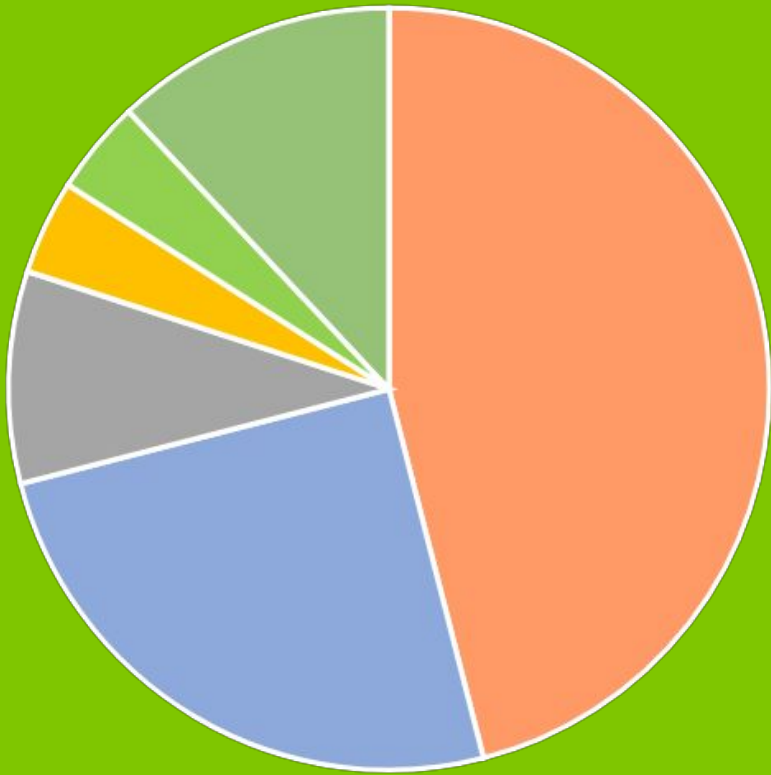


Why we die?



Why we die?

Top 5 Reasons

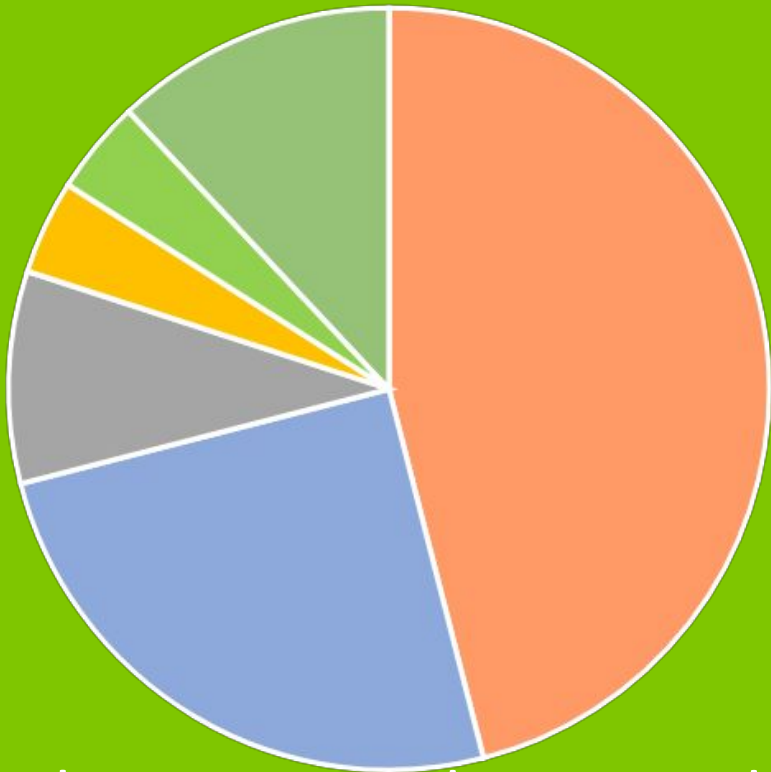


88%



Why we die?

Top 5 Reasons



88%

All can be prevented, reversed or treated with better lifestyle Behaviours



Cardiovascular Disease



80% of premature CVD is preventable

Only 1 in 10 Canadians have ideal heart health

Wh
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Genetics



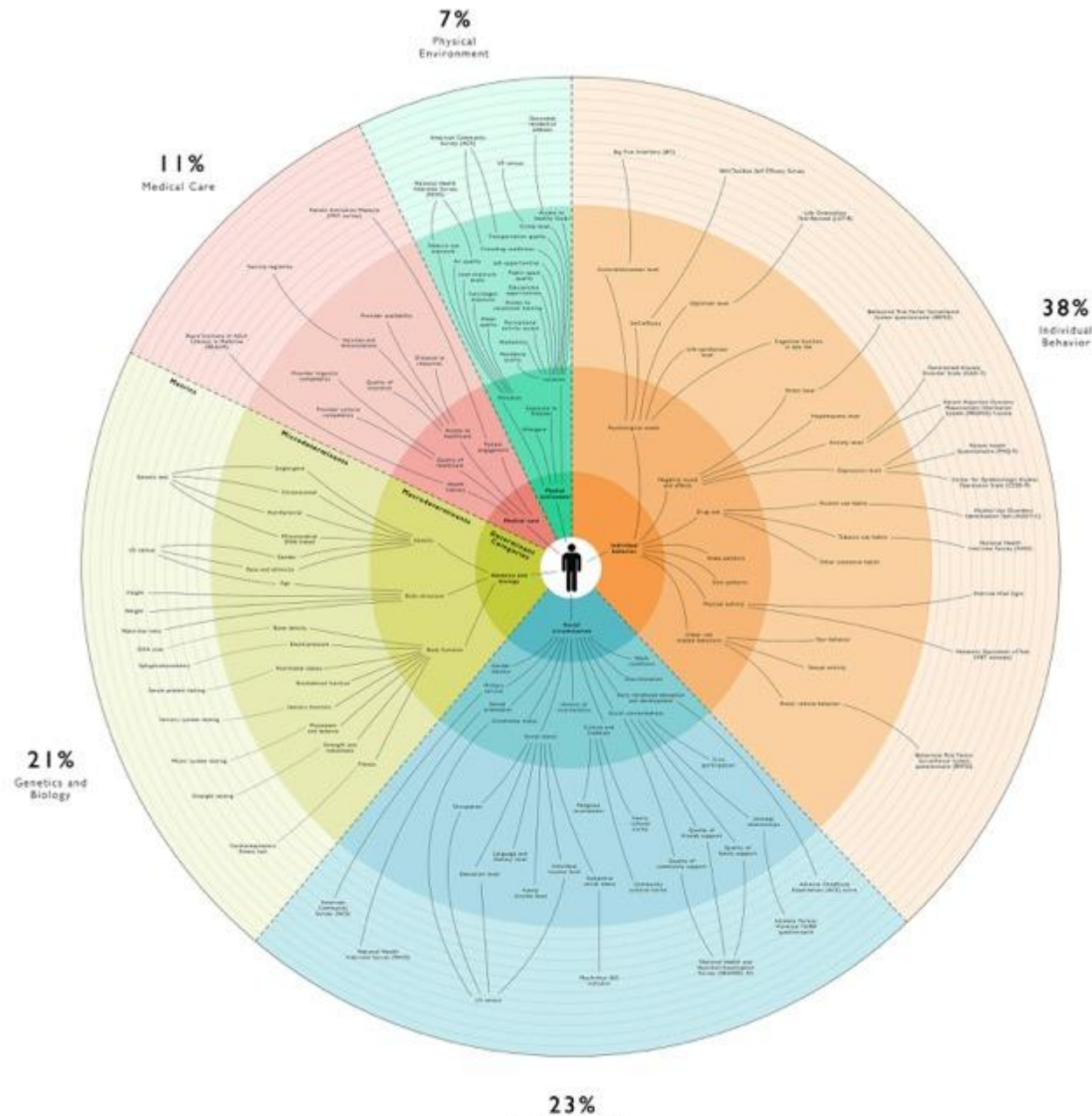
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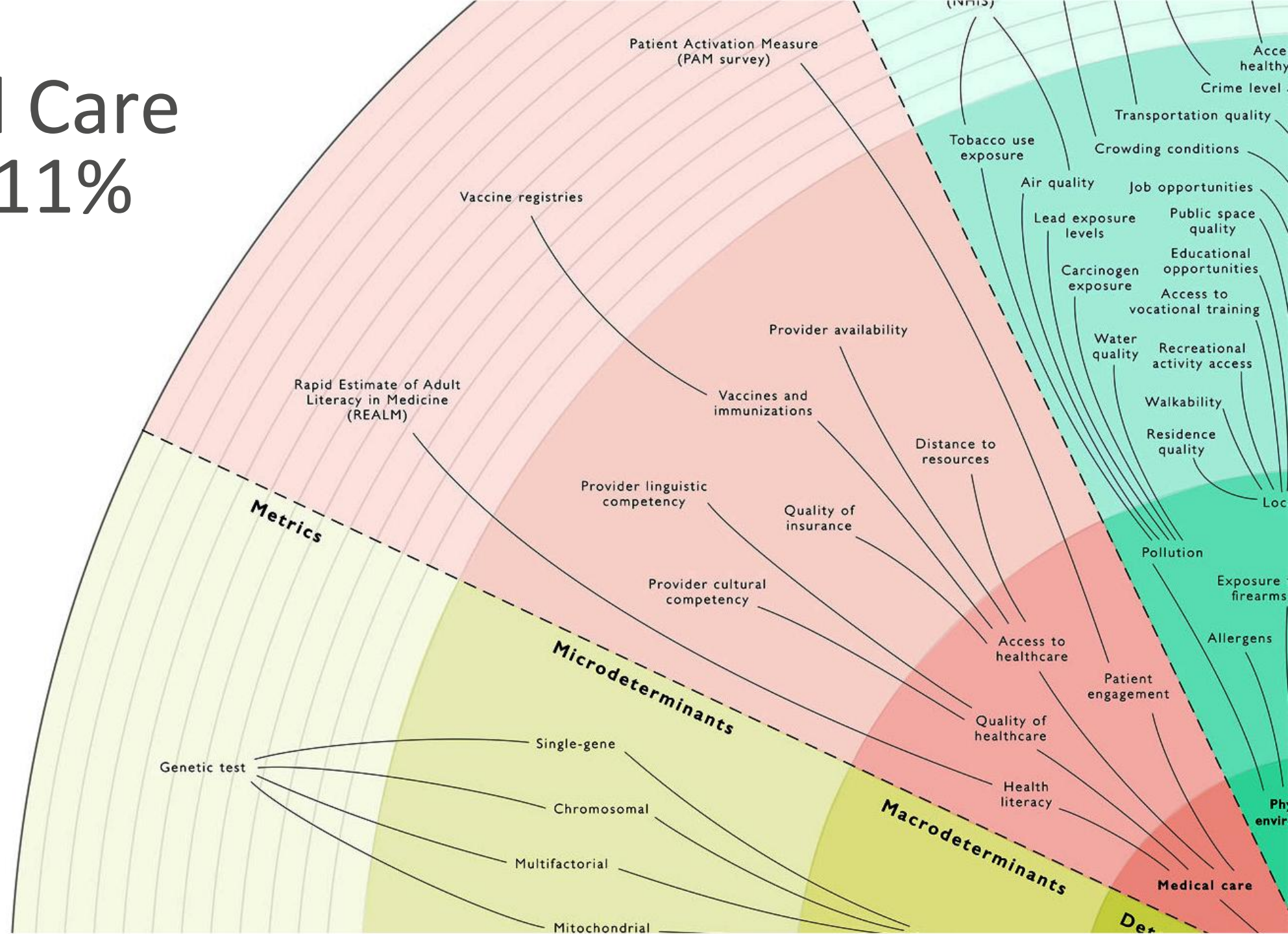
Determinants of Health

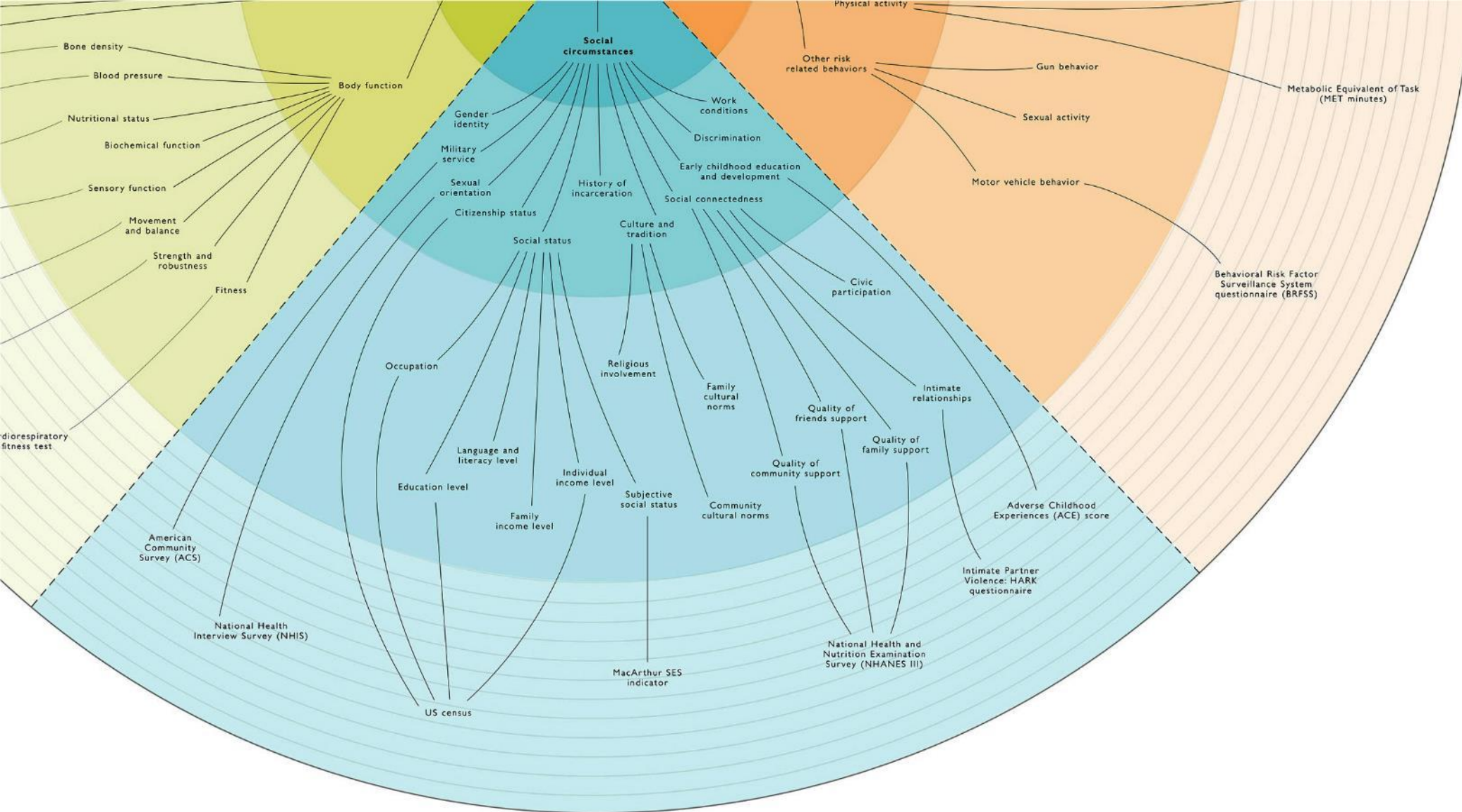


Something
we have
known for a
while



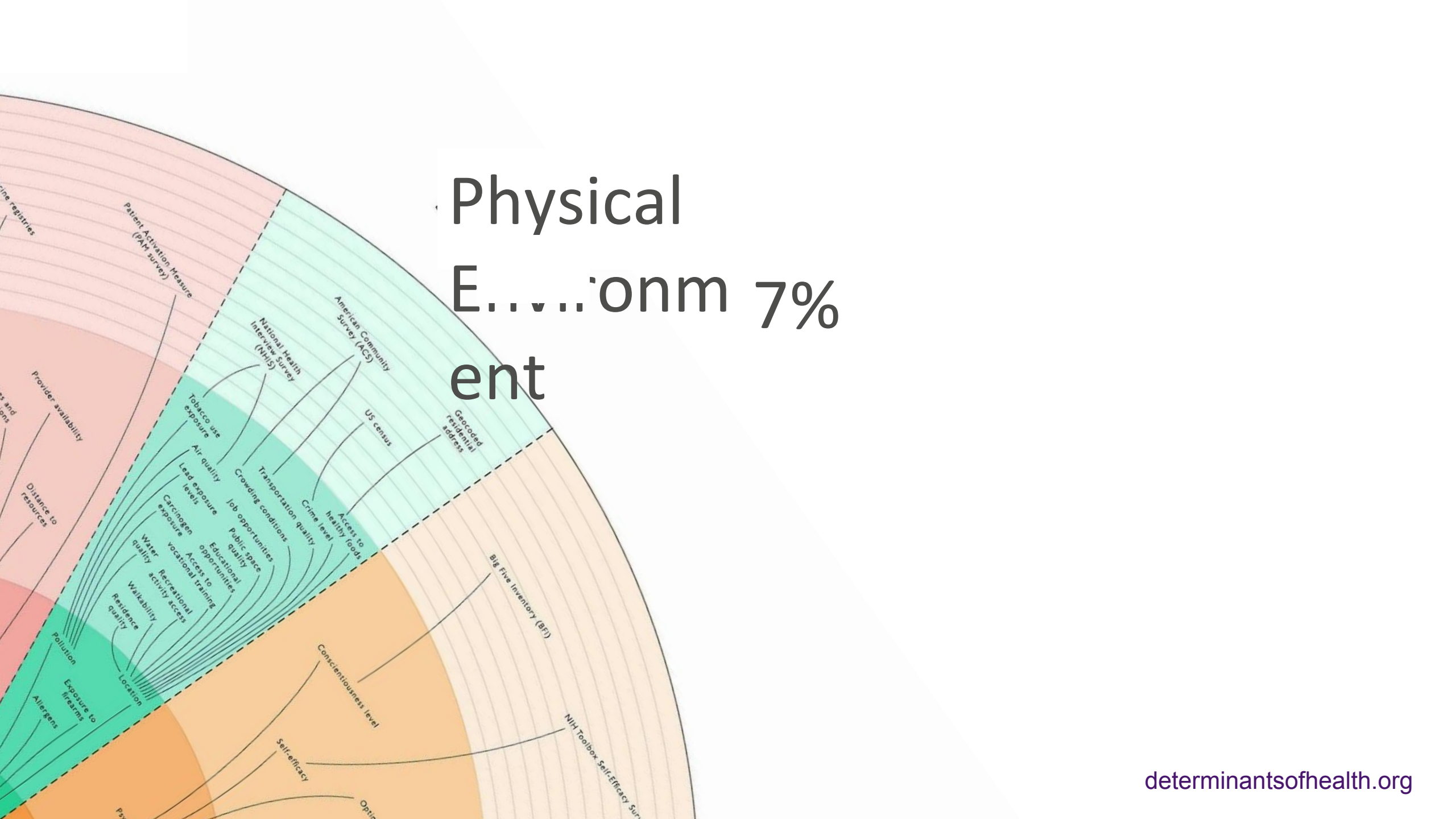
Medical Care 11%





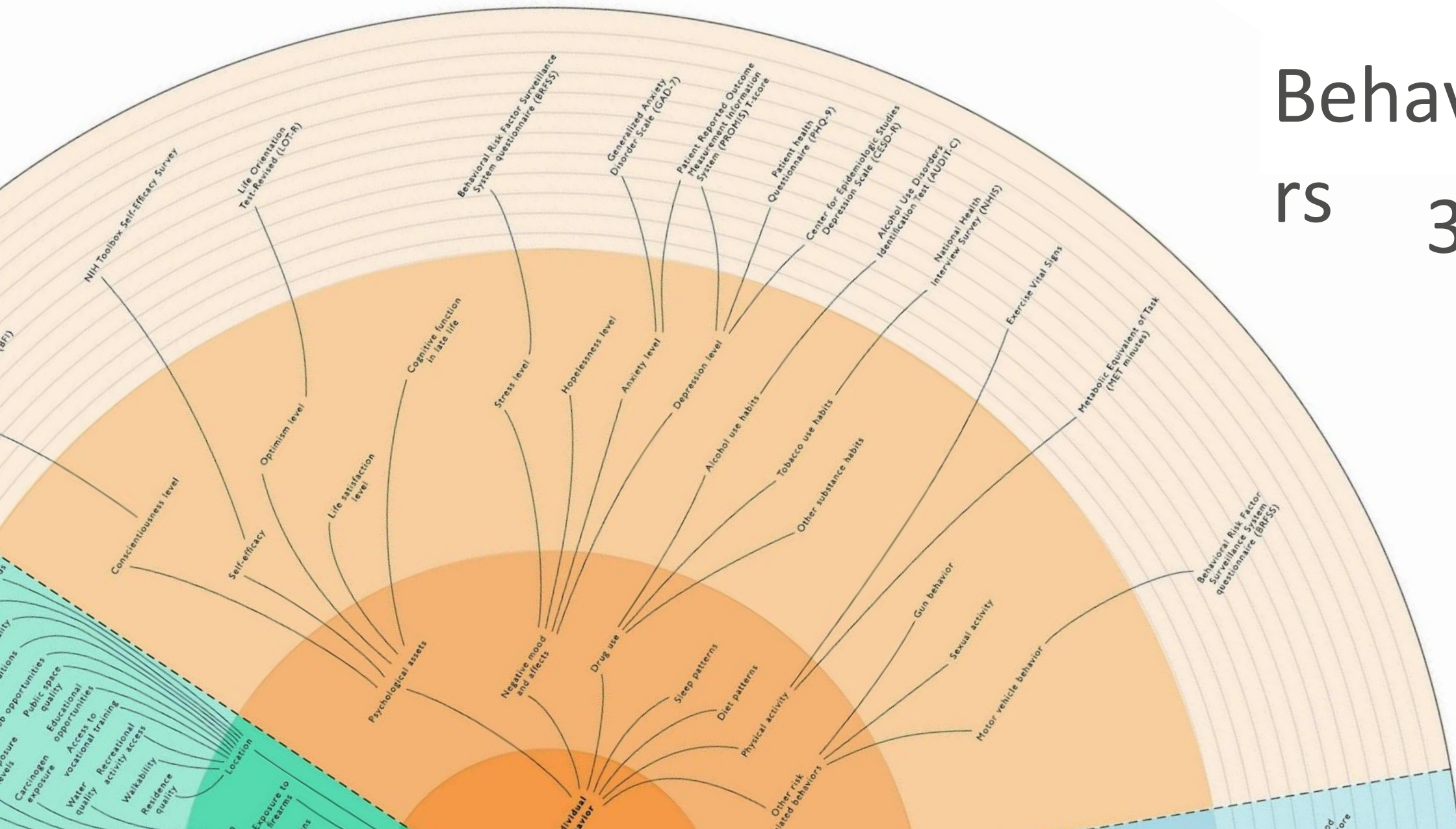
Social

23%



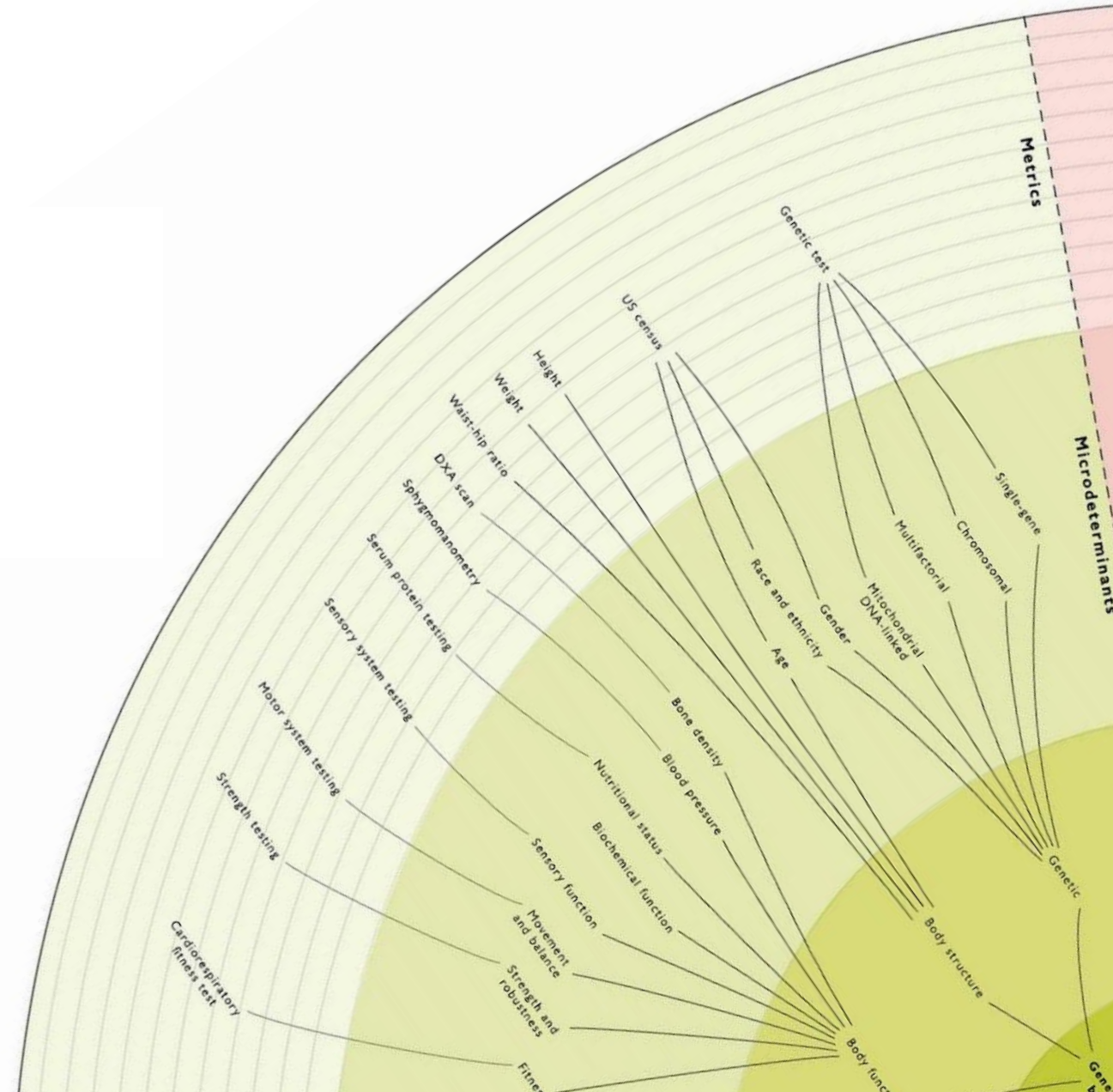
Physical Environment 7% ent

Behaviours 38%

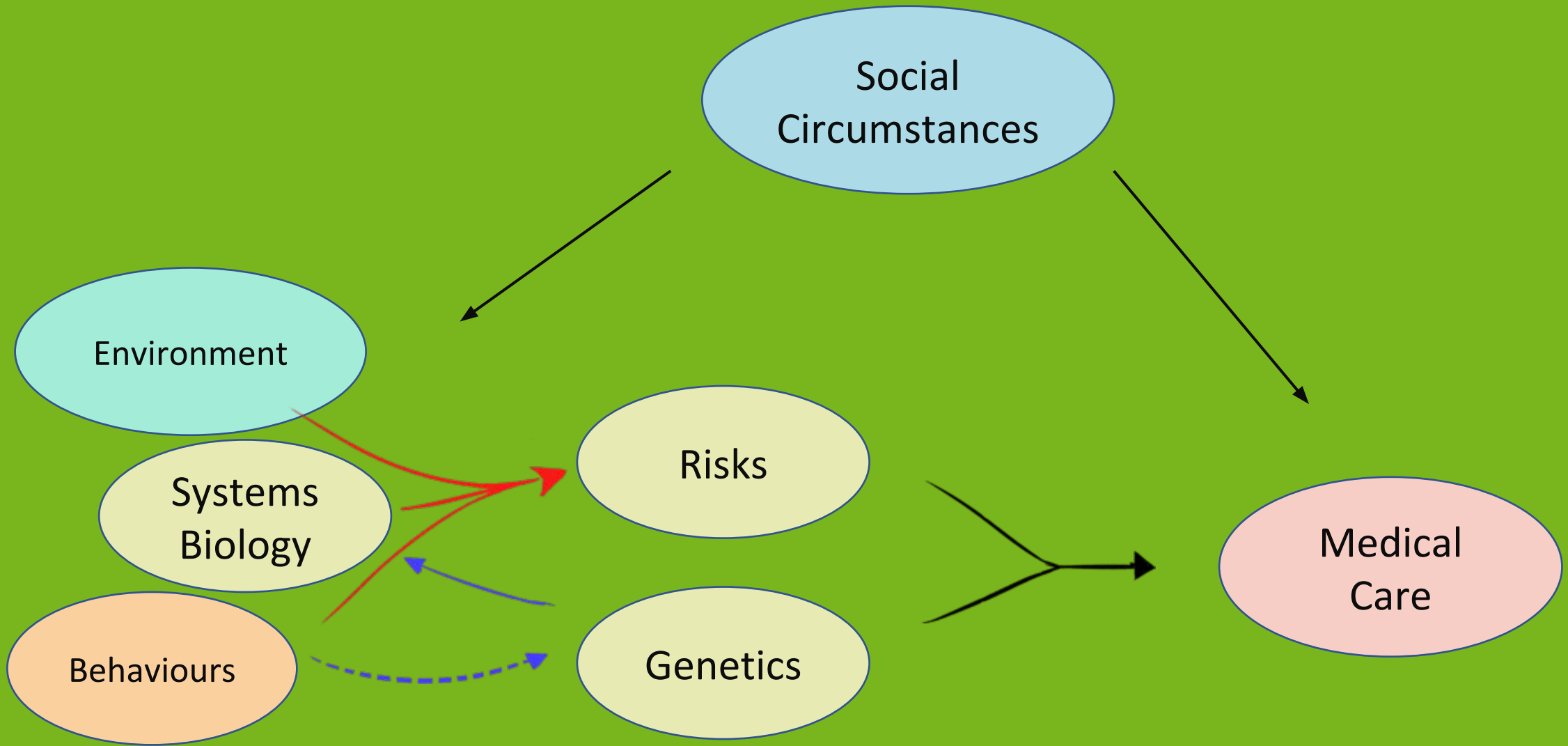


Genetics & Biology

23%

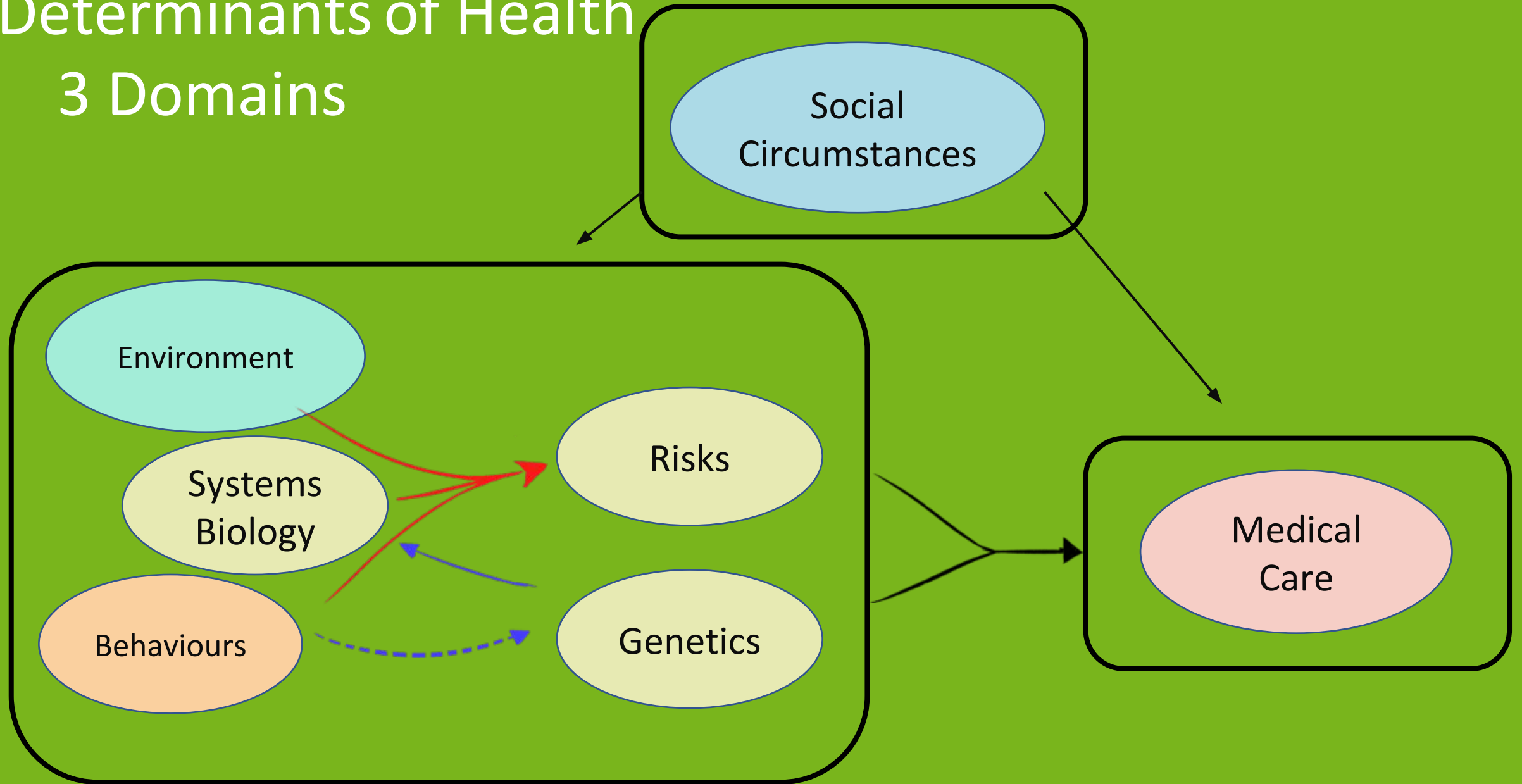


Determinants of Health



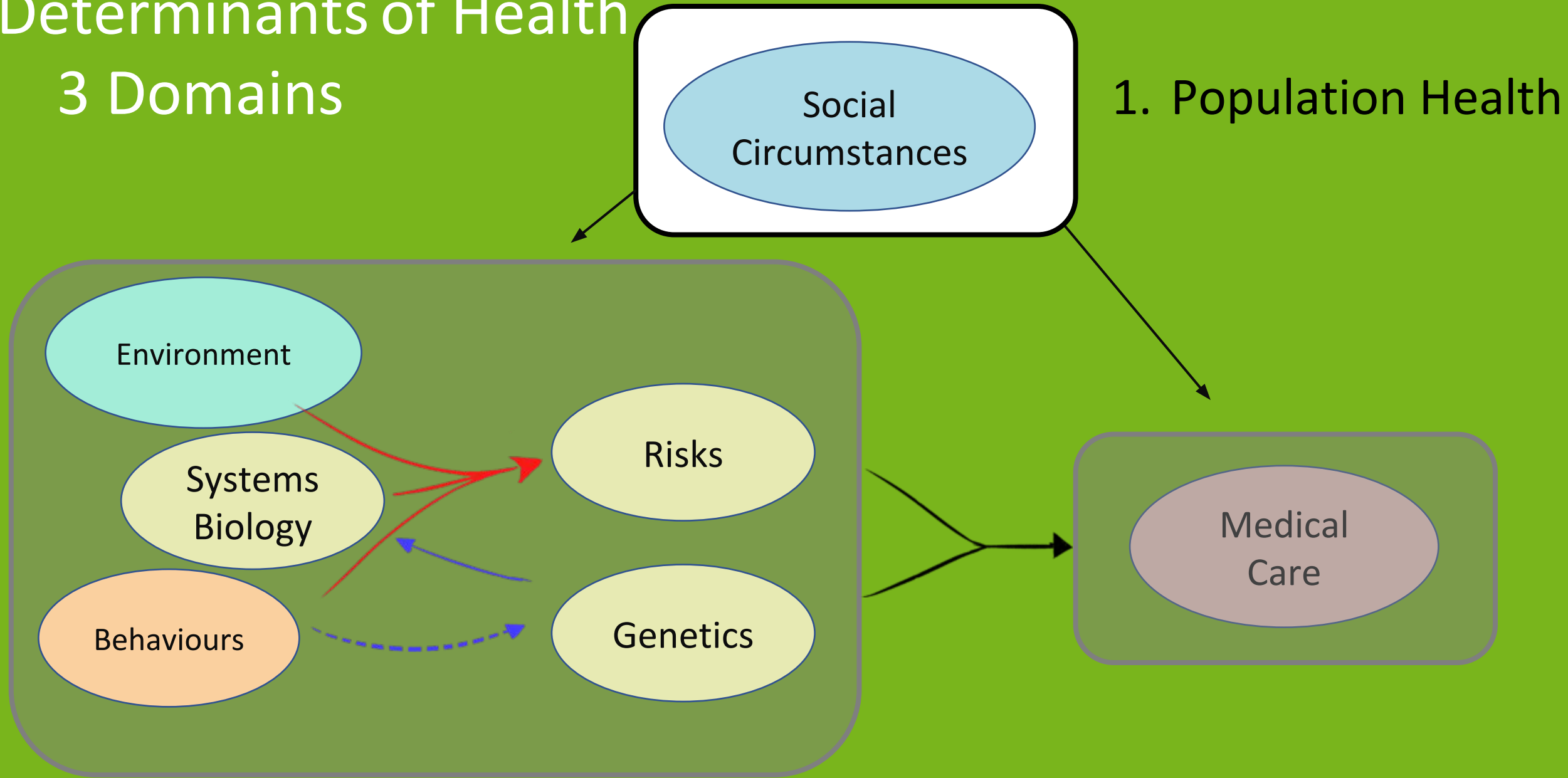
Determinants of Health

3 Domains



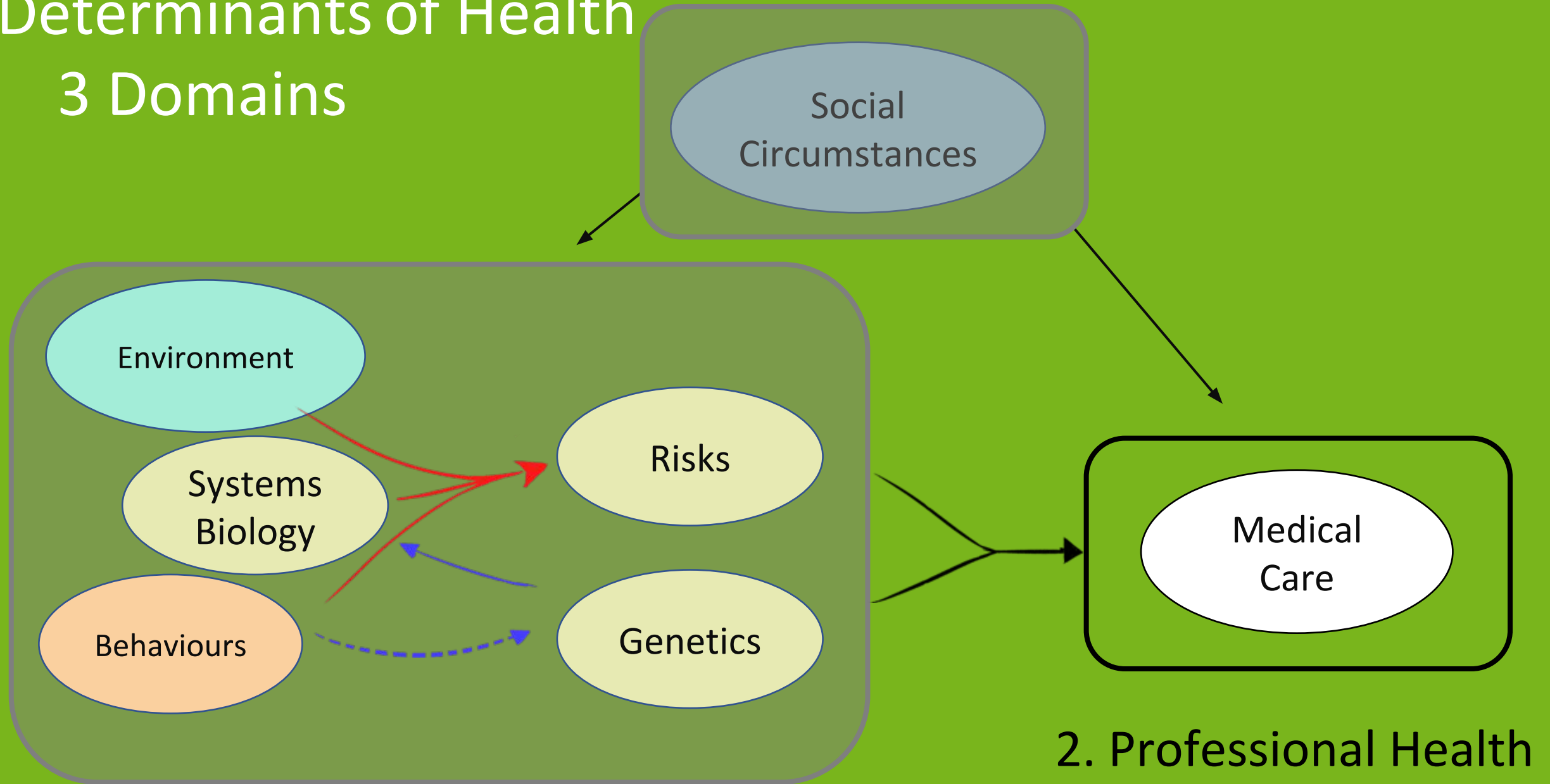
Determinants of Health

3 Domains



Determinants of Health

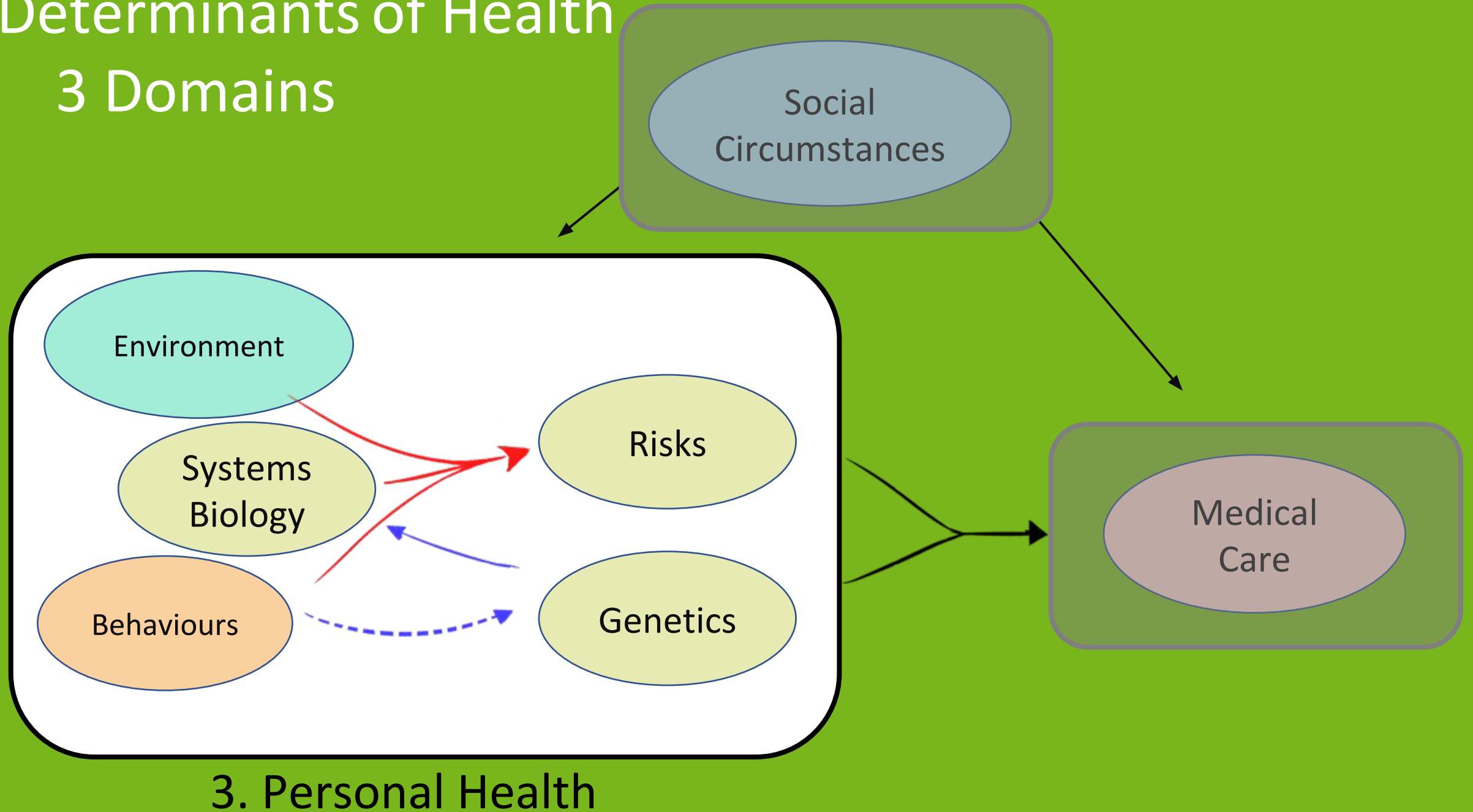
3 Domains



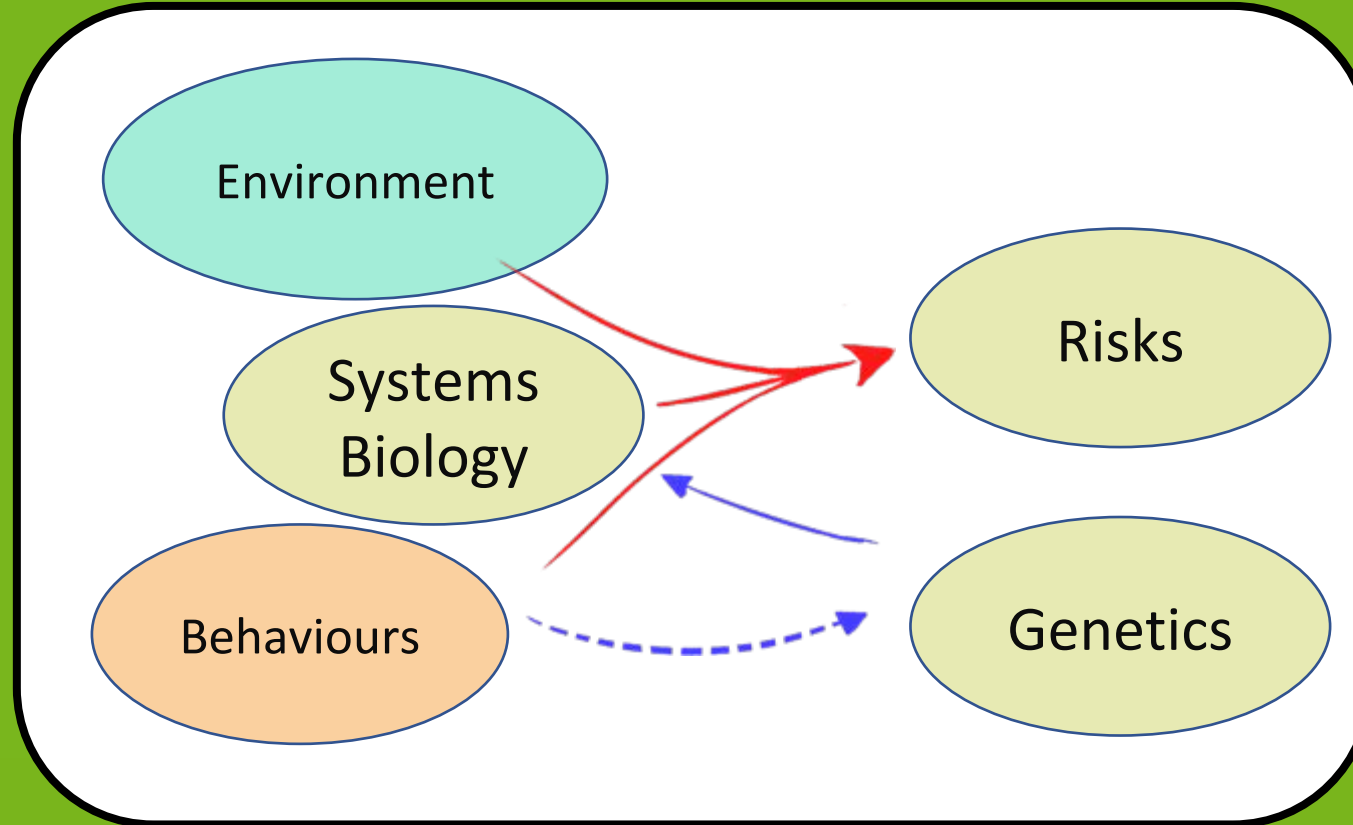
2. Professional Health

Determinants of Health

3 Domains



Personal Health



68%

of health outcomes
determined in this domain

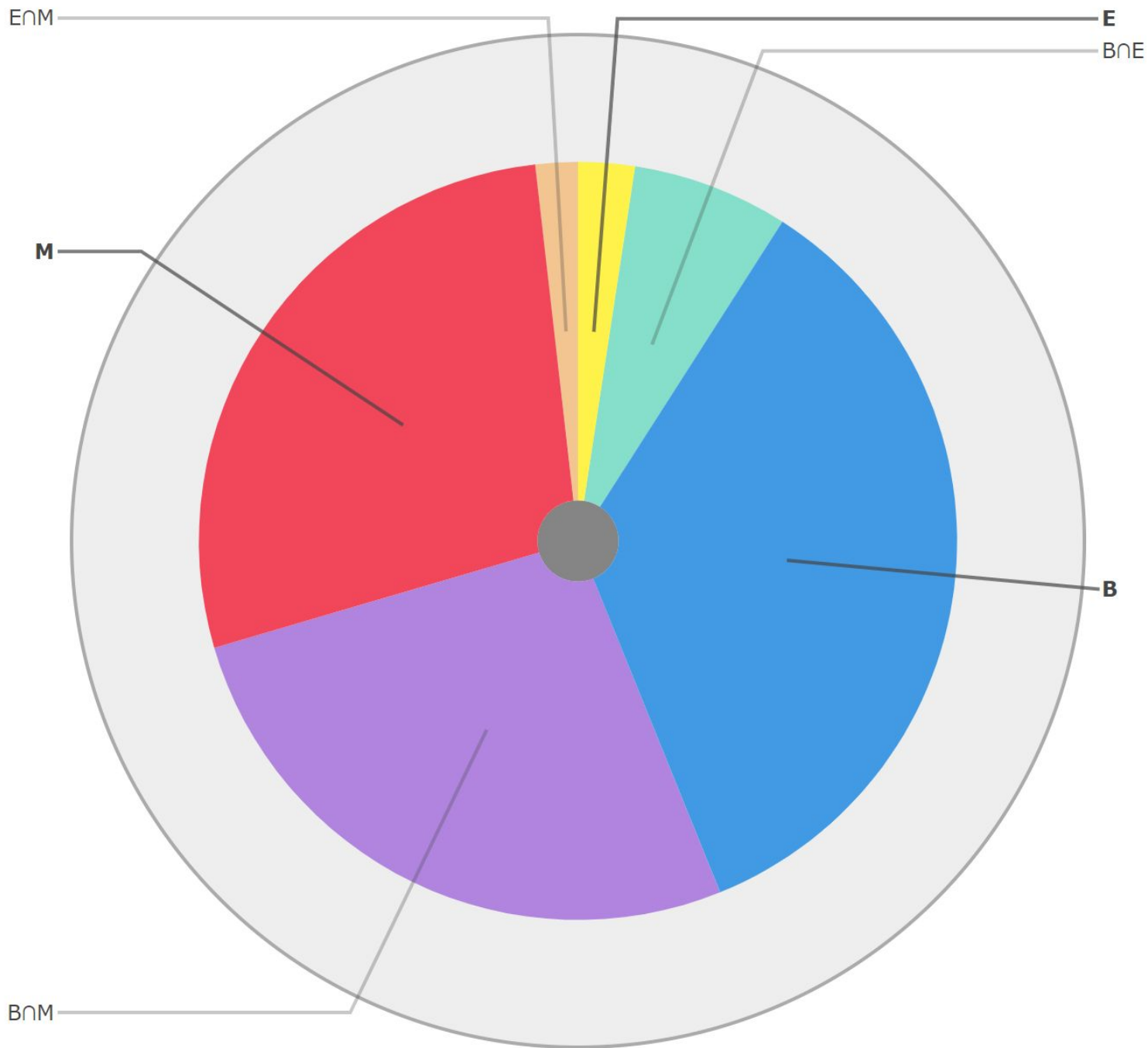
Interplay between genetics, environment and
Behaviours



But we cannot change our genes



But we cannot change our genes, at least not yet

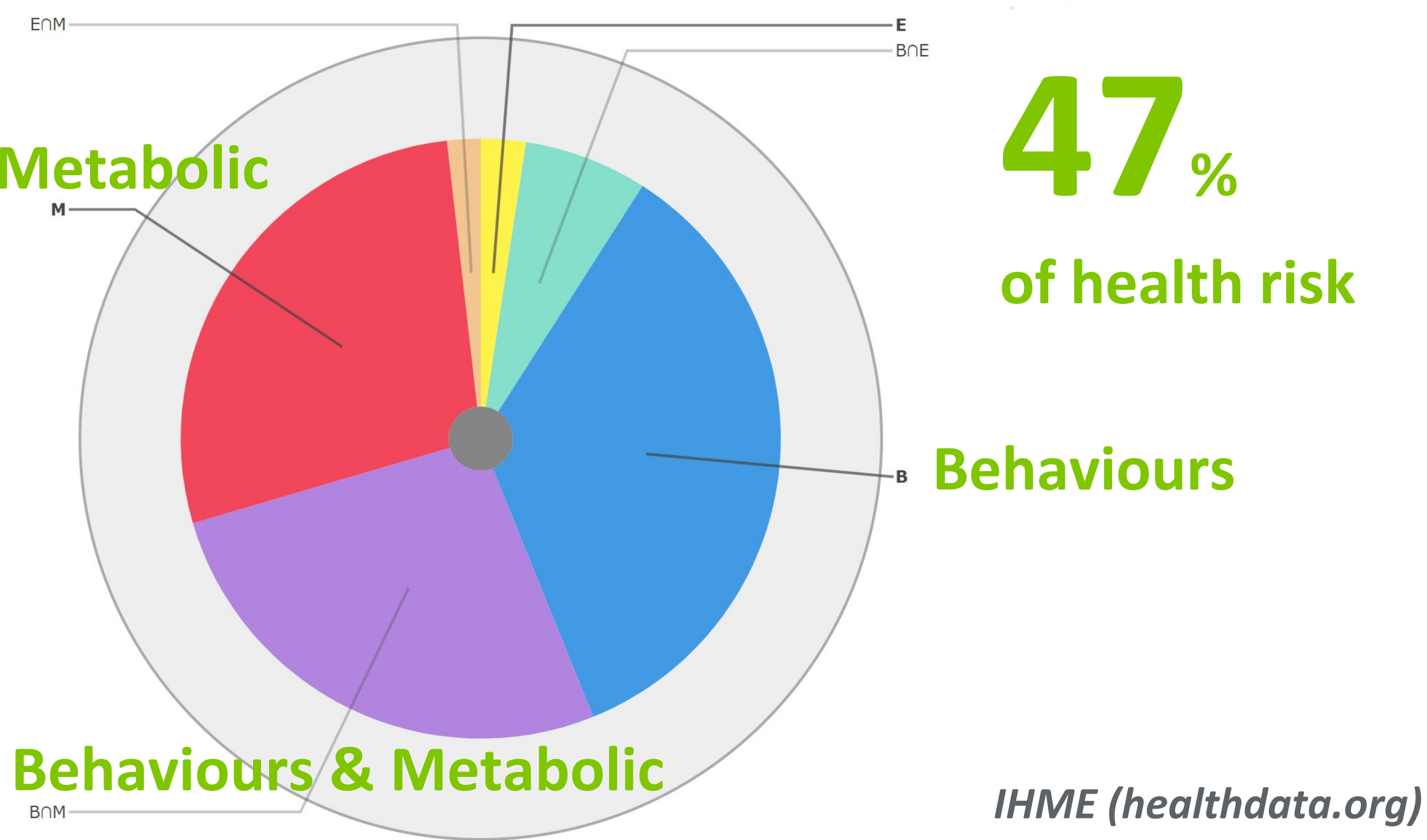


56%

of health risk
comes from:

- Behaviours
- Metabolism
- Environment

IHME (healthdata.org)





30% of Canadians are obese



30% of Canadians are obese
40% of Canadians are overweight



30% of Canadians are obese

40% of Canadians are overweight

70%



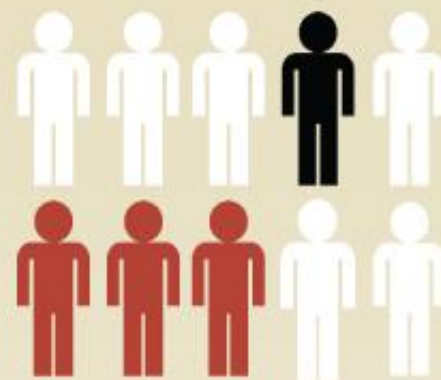
PANCRE
CELLS
RESISTANCE
INSULIN
METABOLISM
STAGES
ISLETS
MONITOR
WEIGHT
CONGENITAL
GLUCOSE
INJECT
SENSITIVITY
NERVE
ENDOCRINE
ACUTE
WELL
DIABETES
TYPE
HEALTHCARE
SYMPTOMS
HYPERGLYCEMIA
KETOACIDOSIS
SUGAR
RESPOND
SULIN
PANCREAS
MELLITUS
ADULTS
INJECT

DIABETES IN CANADA

Every **3 minutes** another Canadian is diagnosed with diabetes.

29% of Canadians are currently **living with diabetes or prediabetes**.

This will rise to **33%** by **2025** if current trends continue.



At least
1 in 10

deaths in Canadian adults was attributable to diabetes in 2008/09.

TODAY 3.4 million

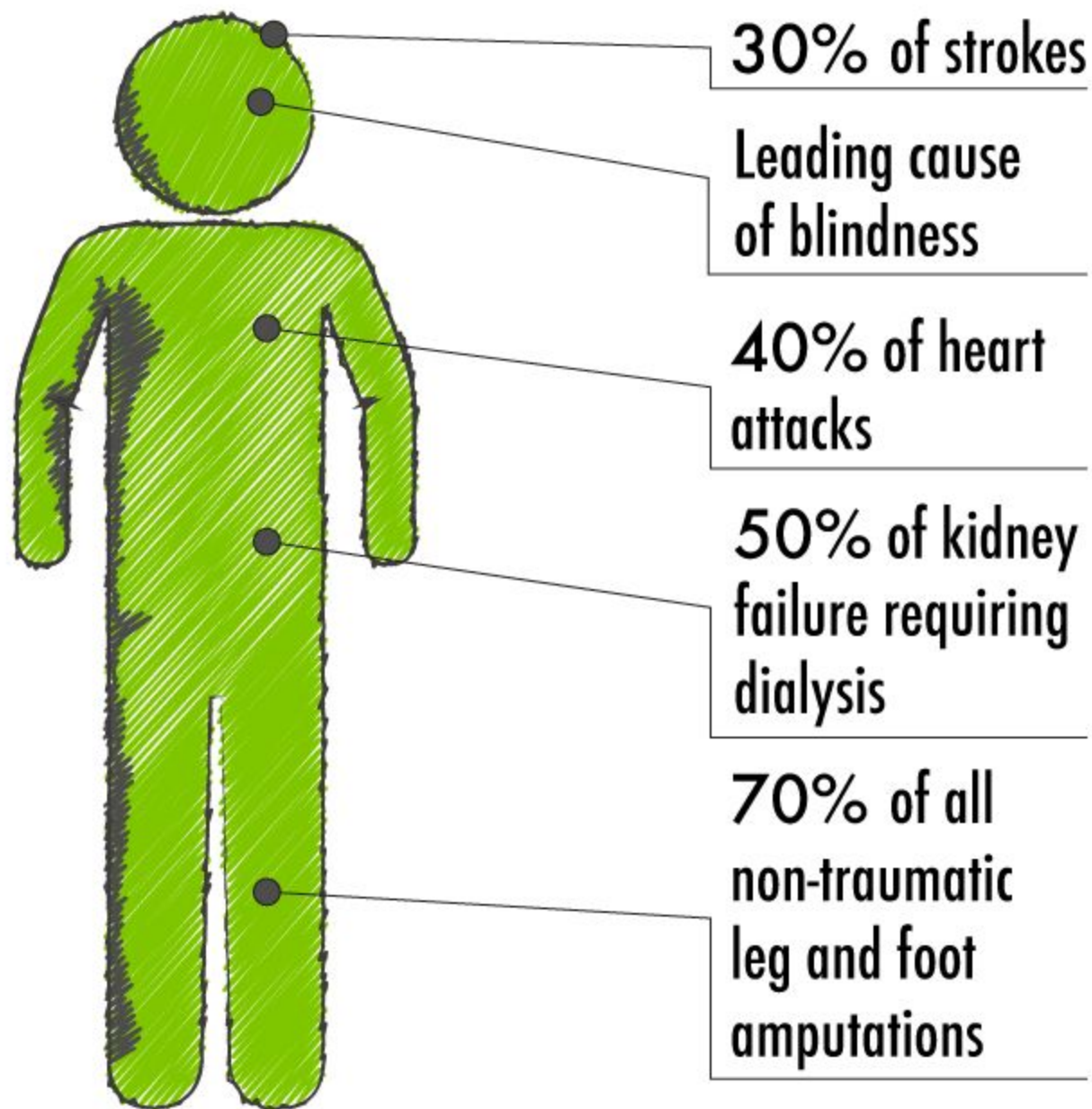
Canadians are estimated to be living with diabetes.

Diabetes is costing the country
\$14 billion per year

2025 That number is expected to reach more than
5 million people in the next 10 years.

In 10 years it will cost approximately
\$17.5 billion per year

Diabetes contributes to



5.5 mmol/L

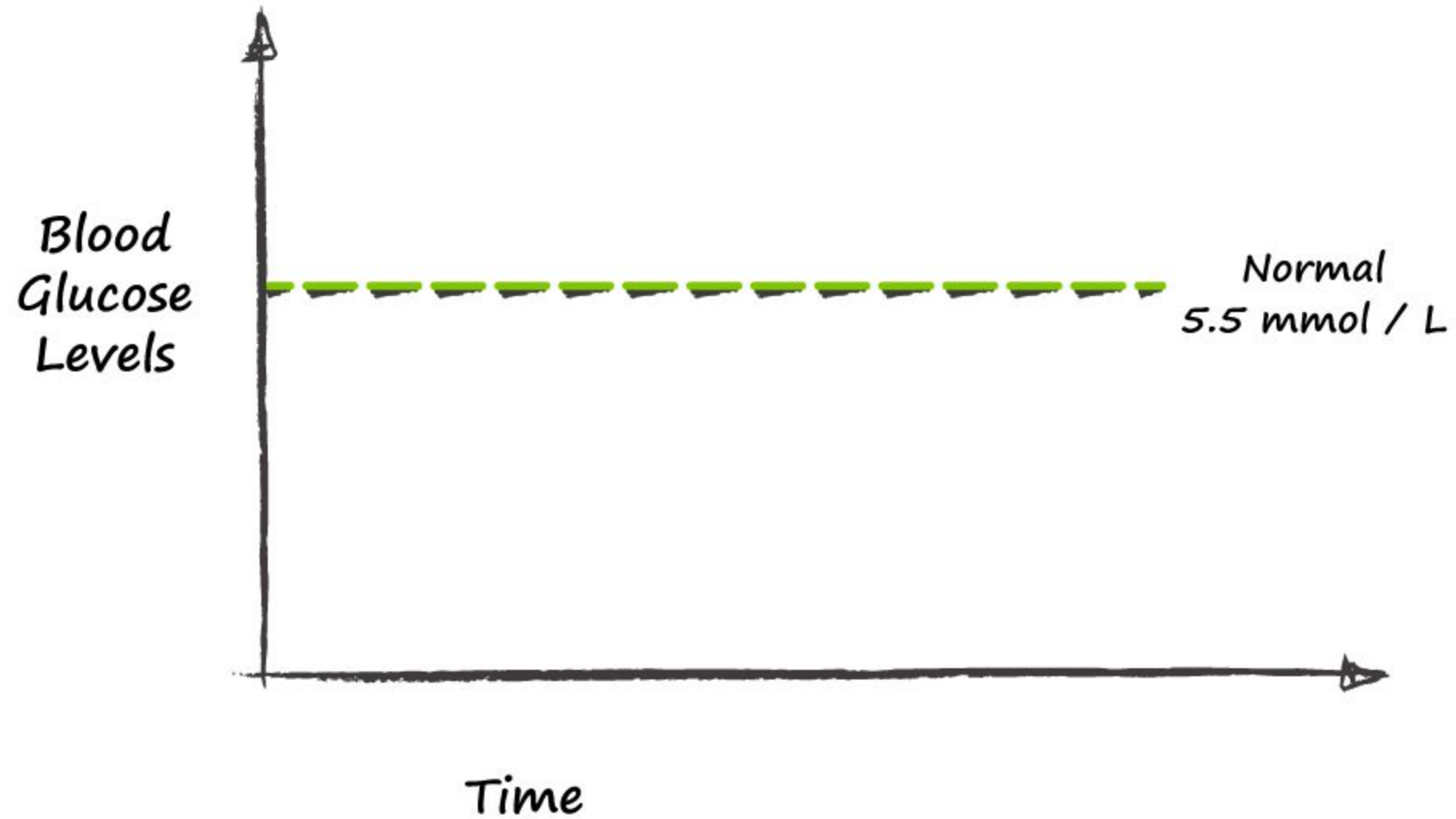


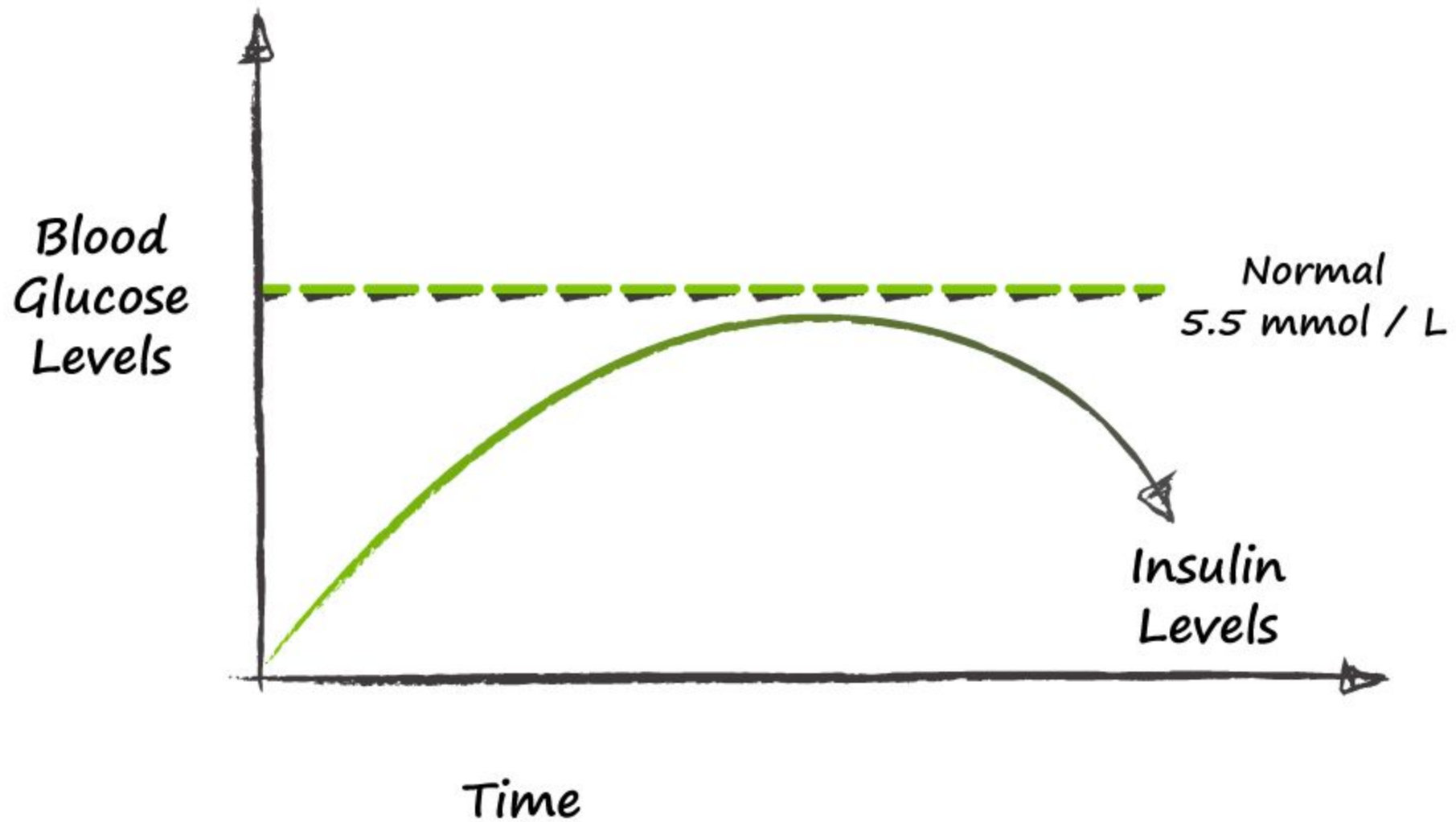


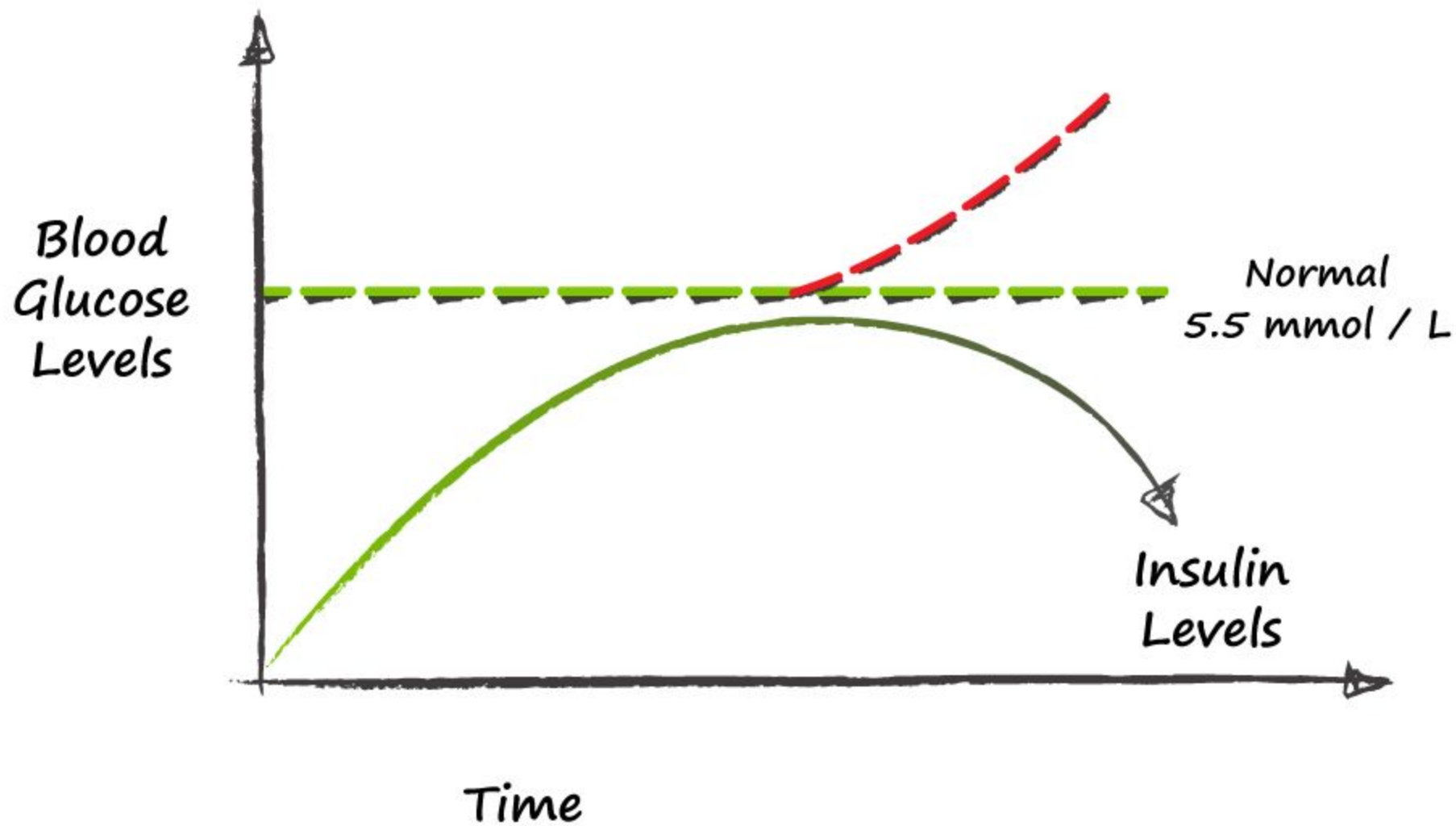
A hand-drawn coordinate system with a vertical y-axis and a horizontal x-axis. Both axes have arrowheads at their ends. The y-axis is labeled 'Blood Glucose Levels' and the x-axis is labeled 'Time'. The axes intersect at the origin, forming an L-shape.

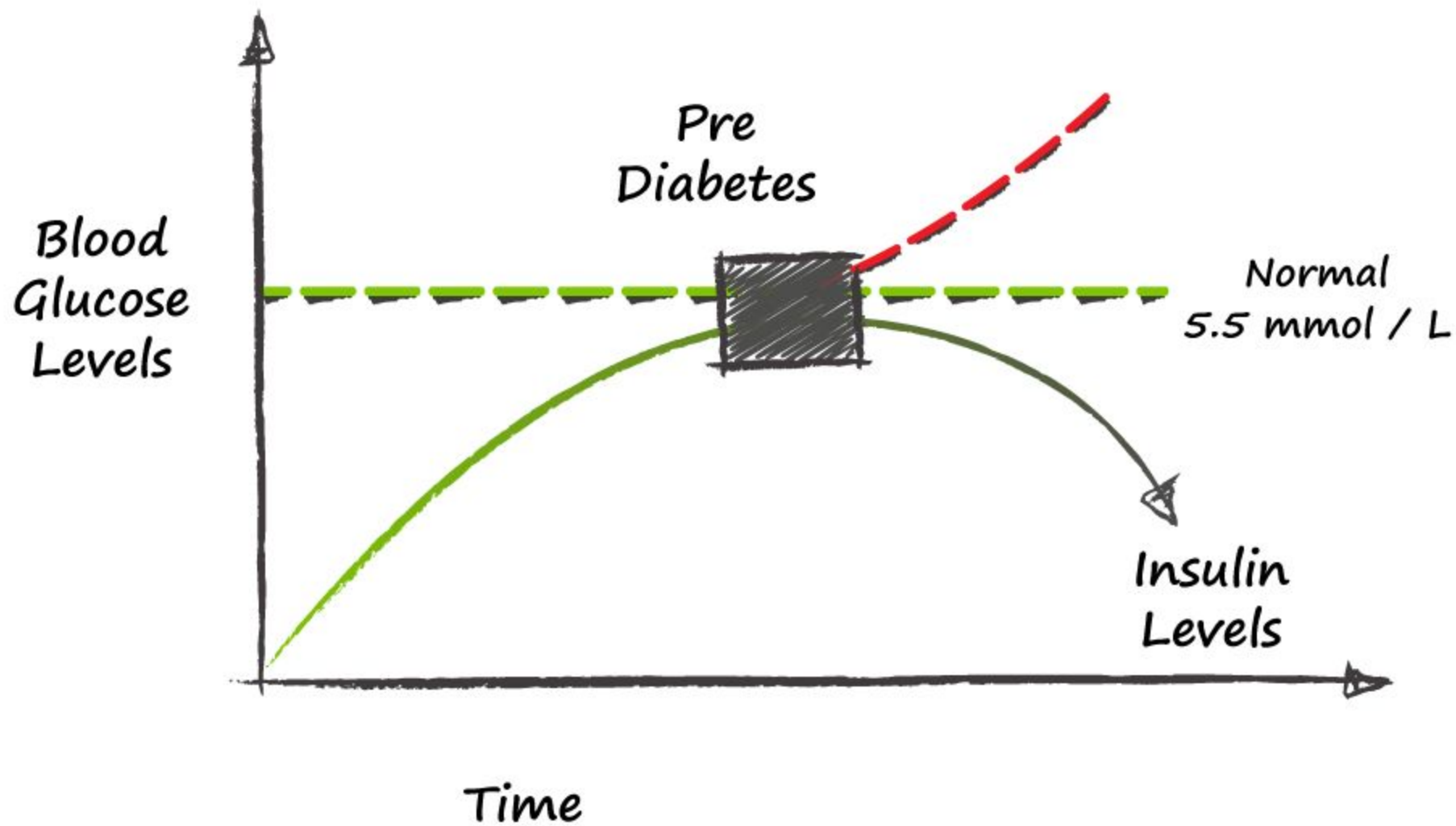
Blood
Glucose
Levels

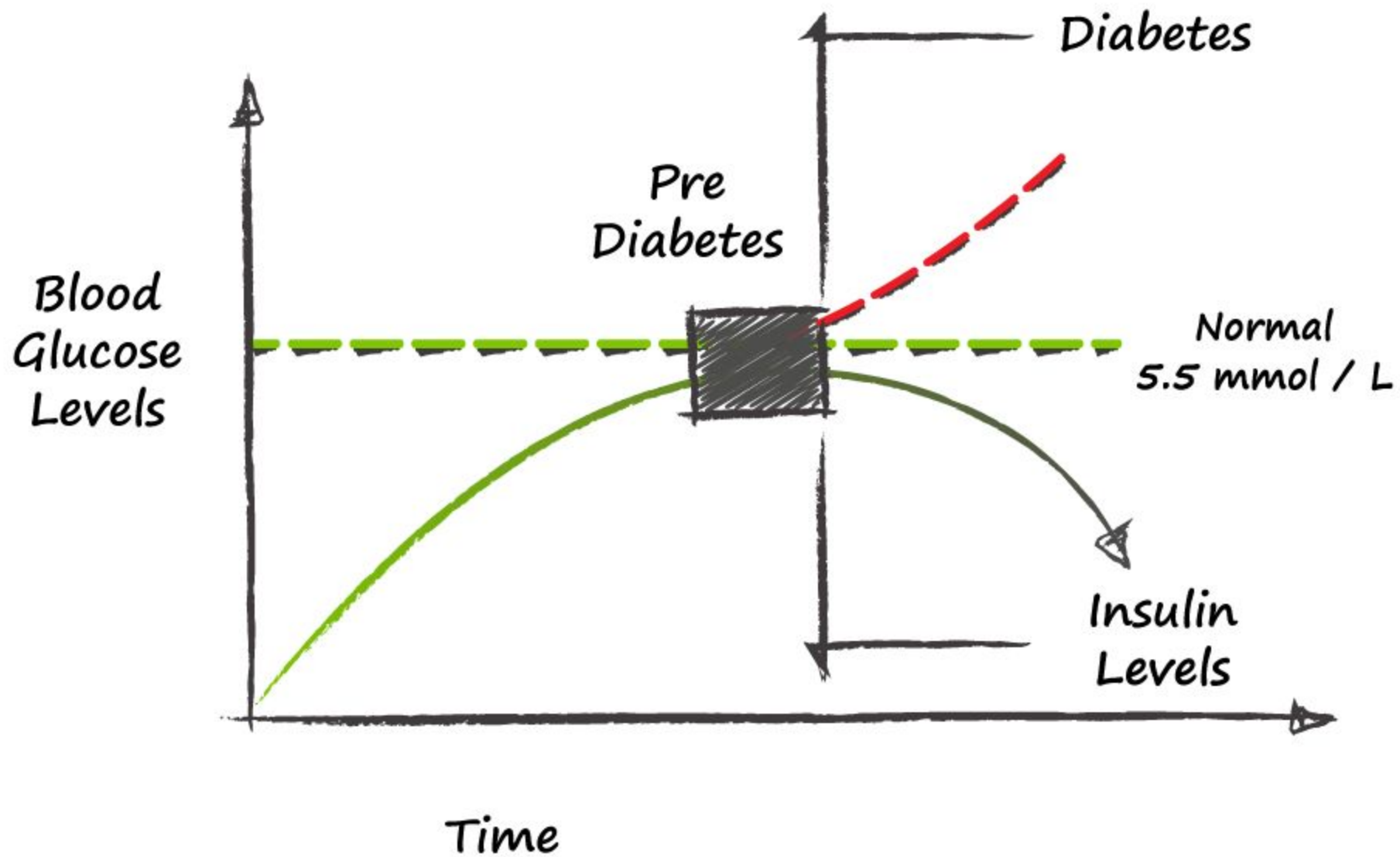
Time

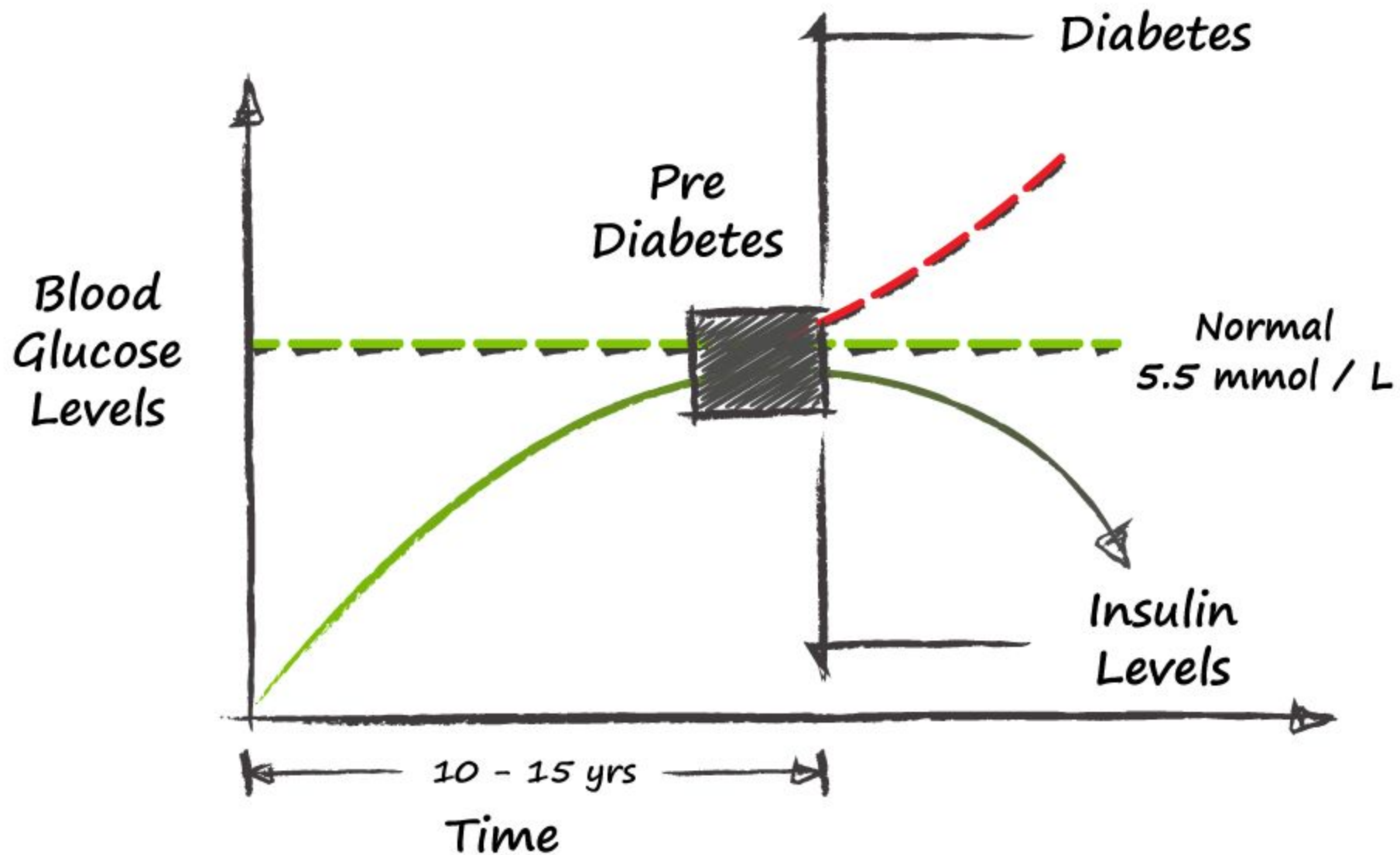


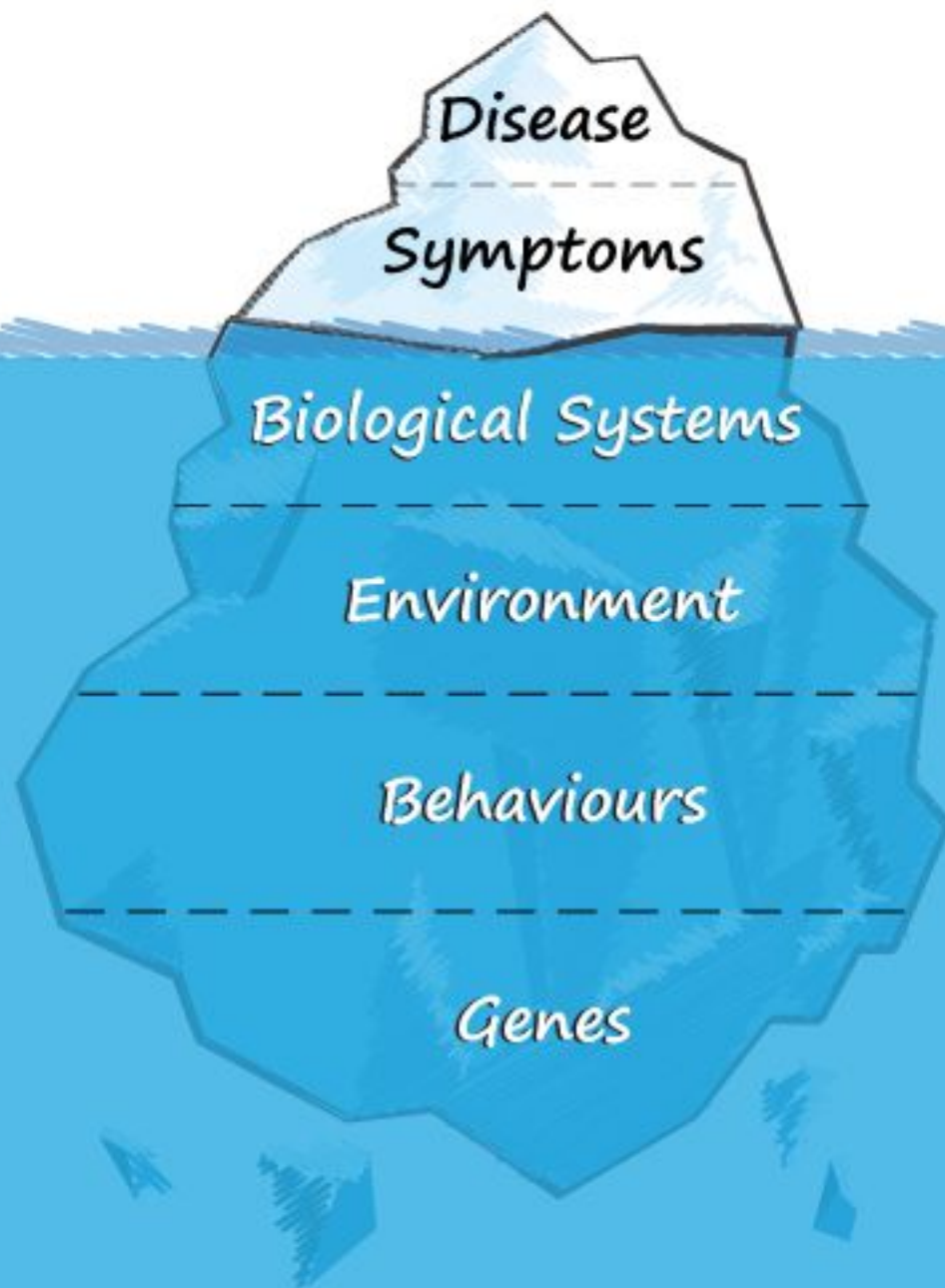


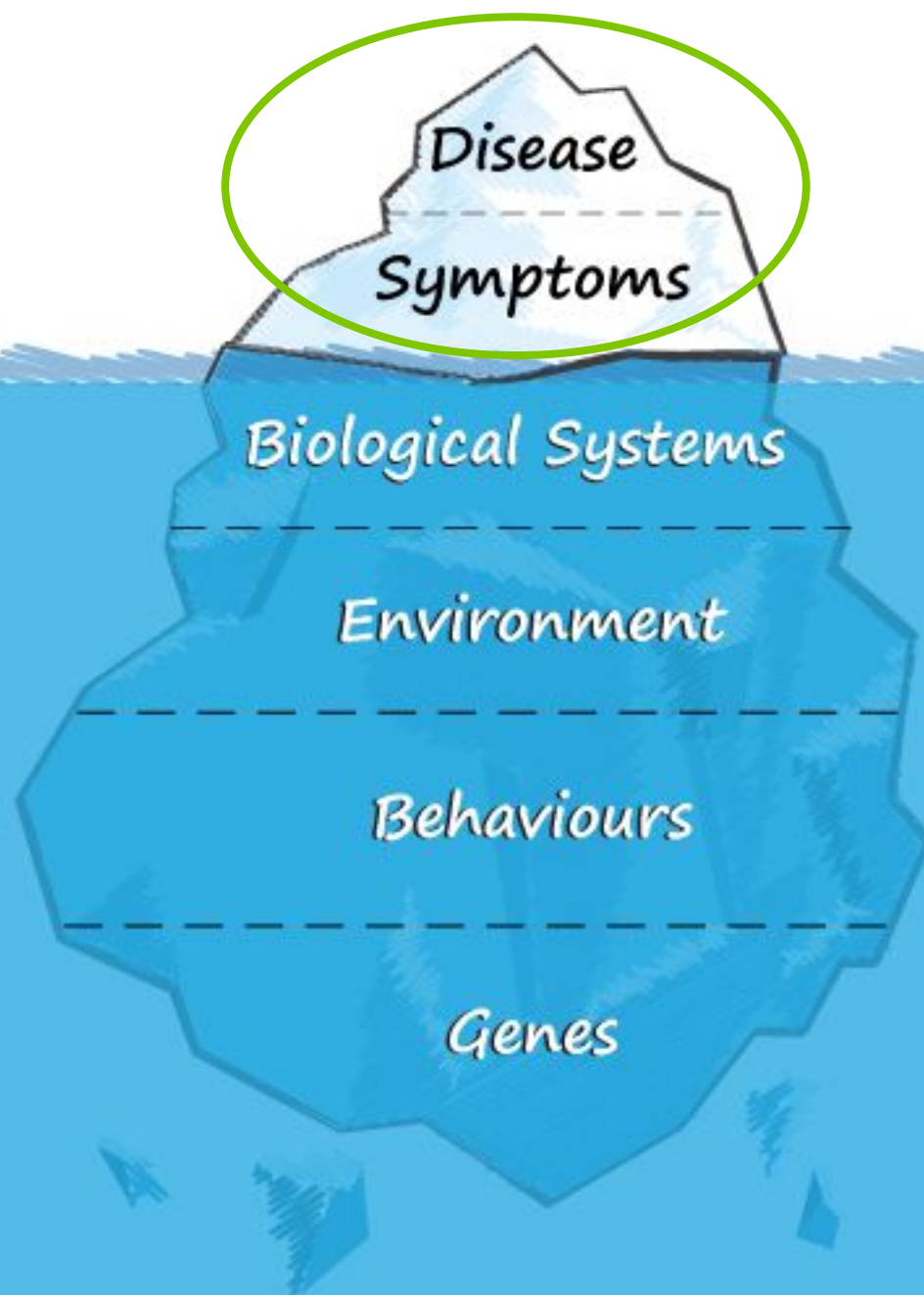




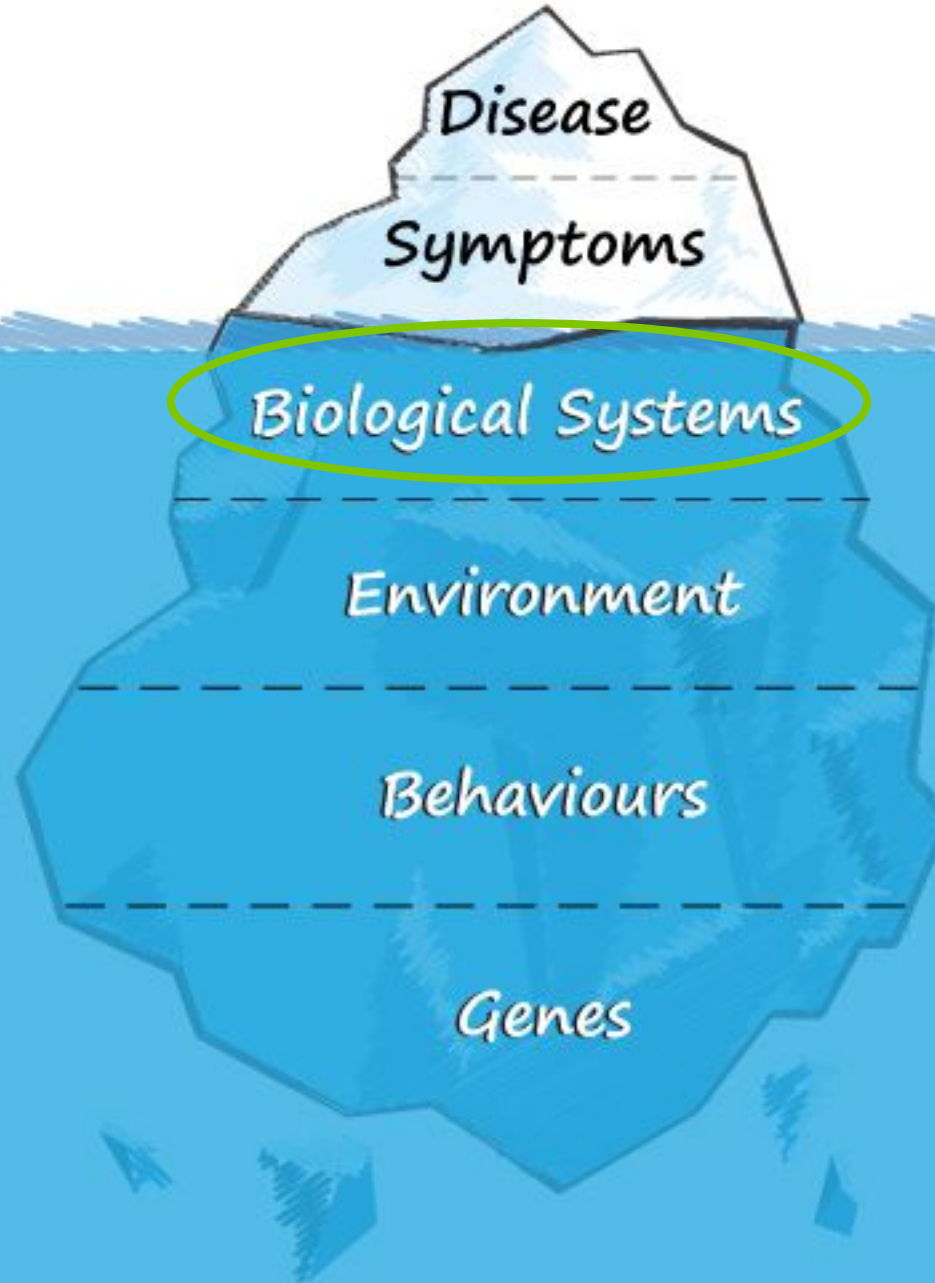




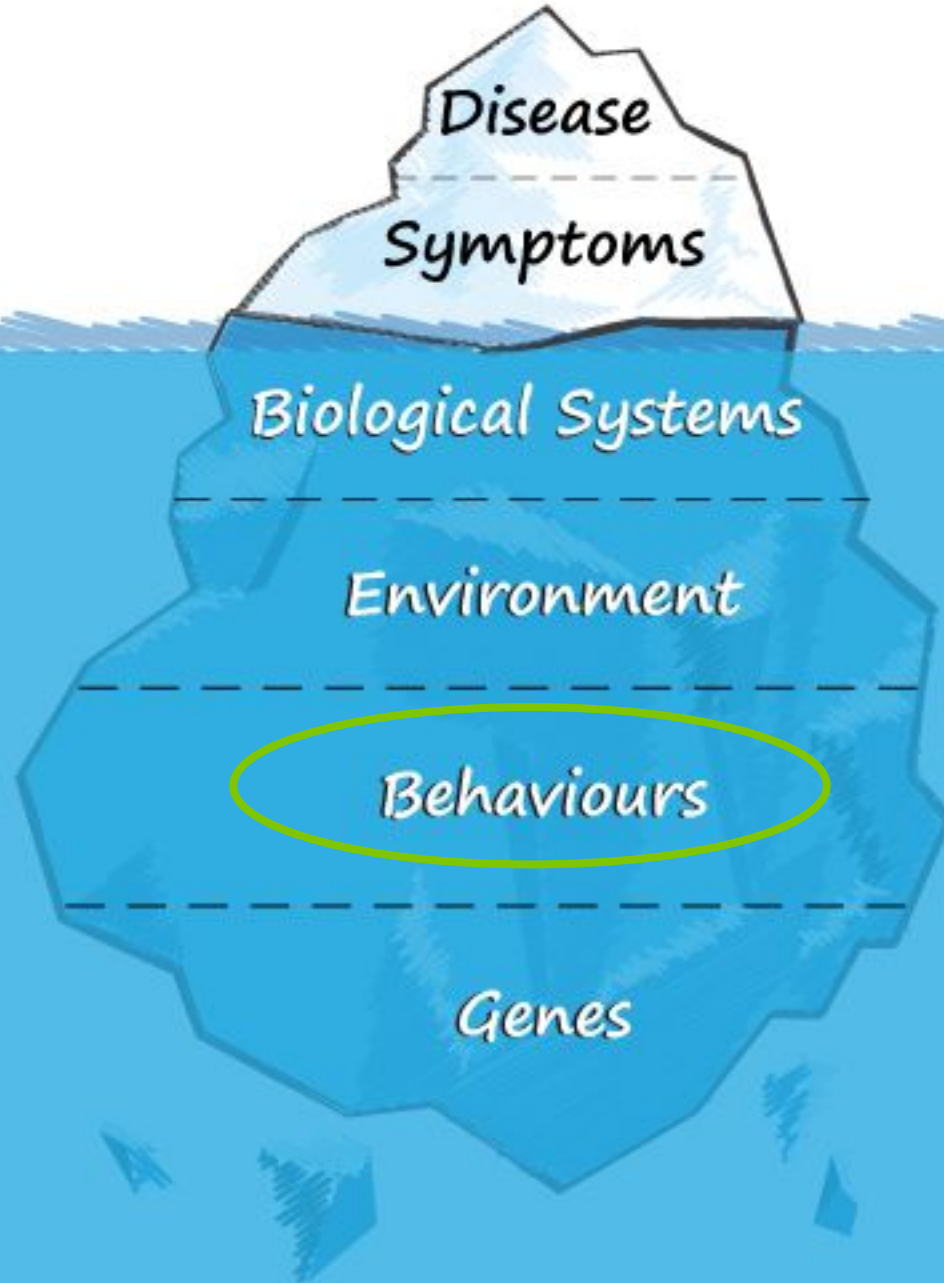




Medical, Nutrition &
Fitness Assessments



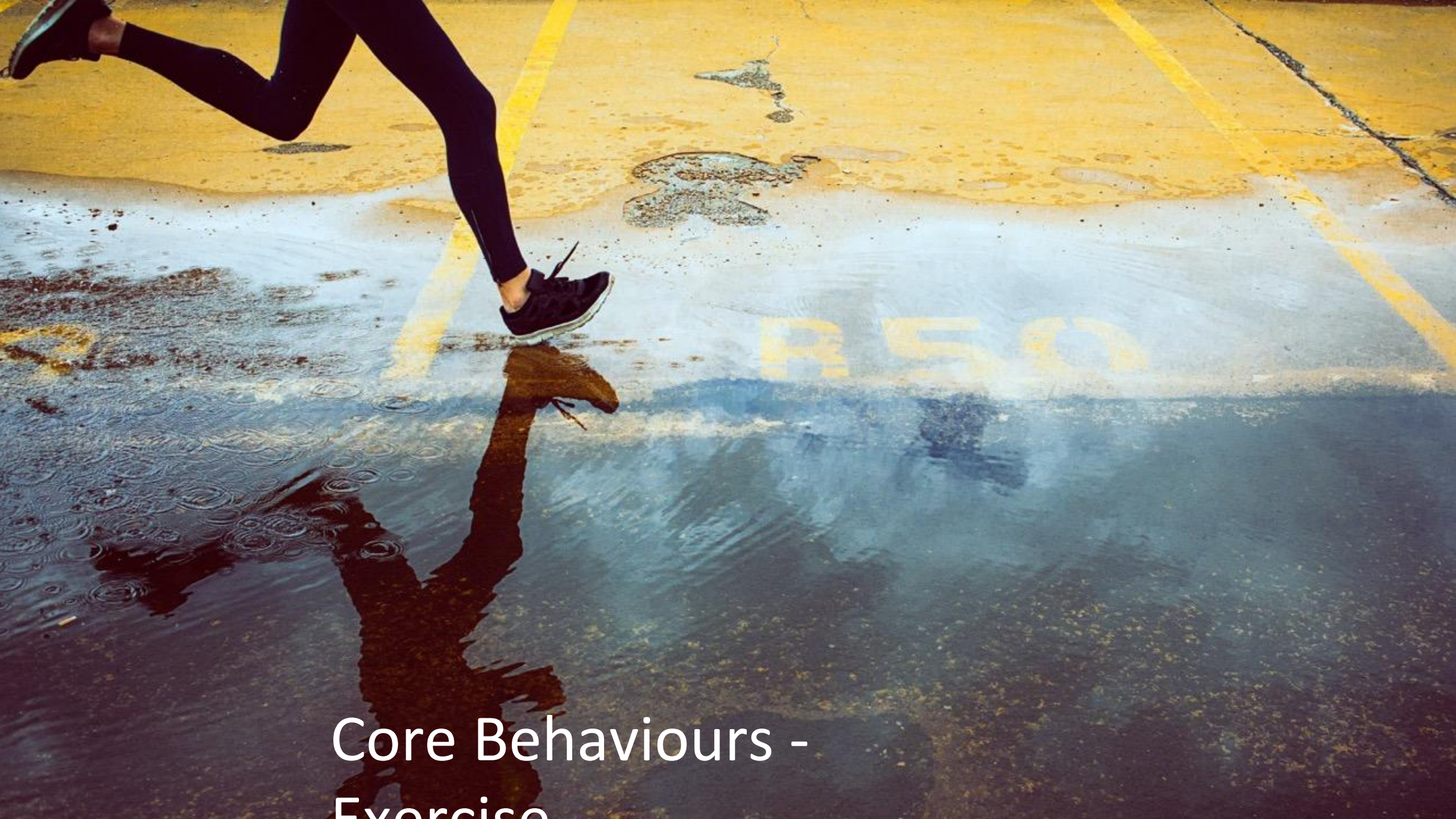
Lab work, DXA, Other



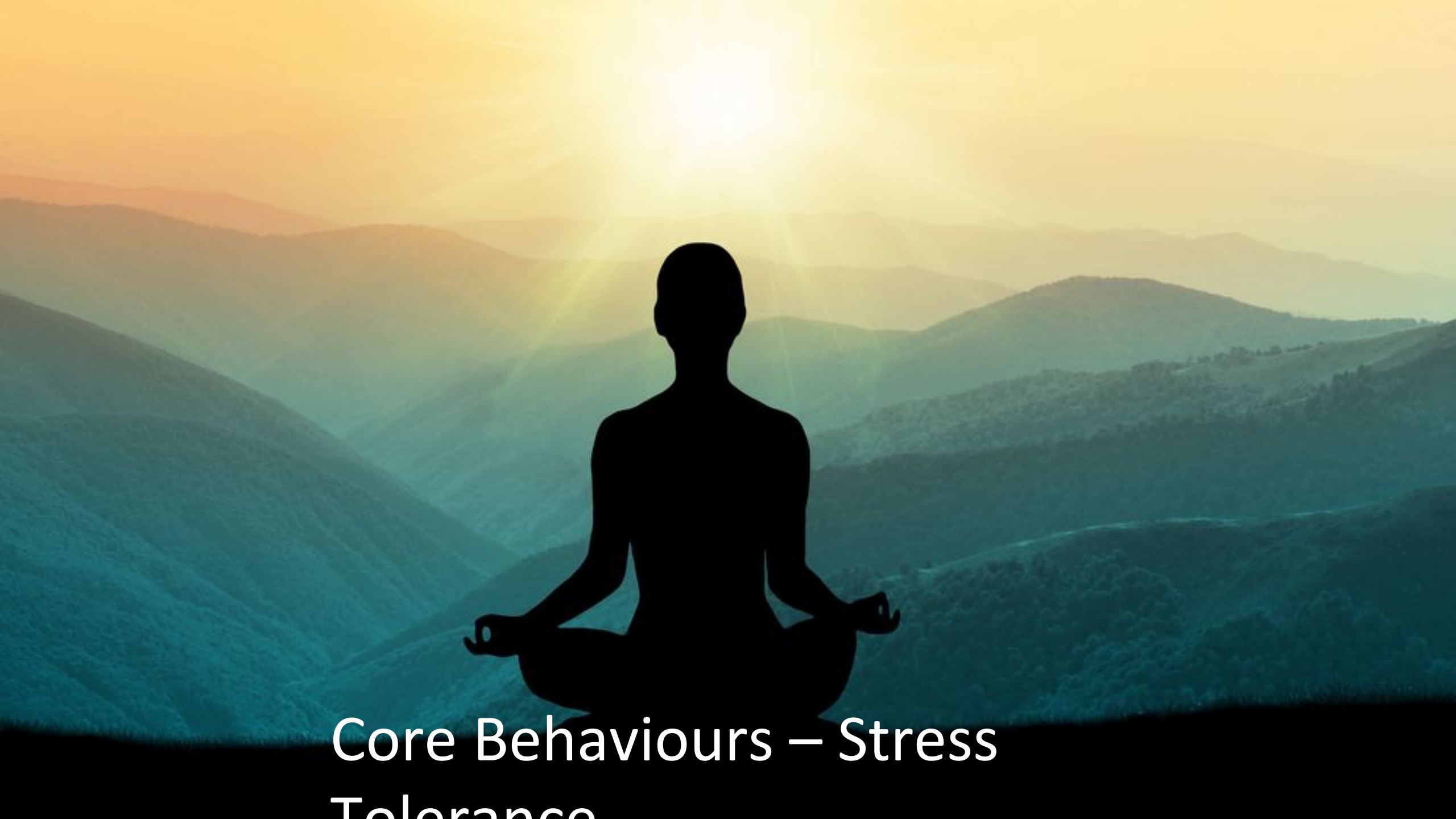
Behaviour Grid



Core Behaviour –
Food/Nutrition



Core Behaviours -
Exercise



Core Behaviours – Stress
Tolerance



Core Behaviours -
Sleep



Core Behaviours - Relationships



Core Behaviours - Purpose

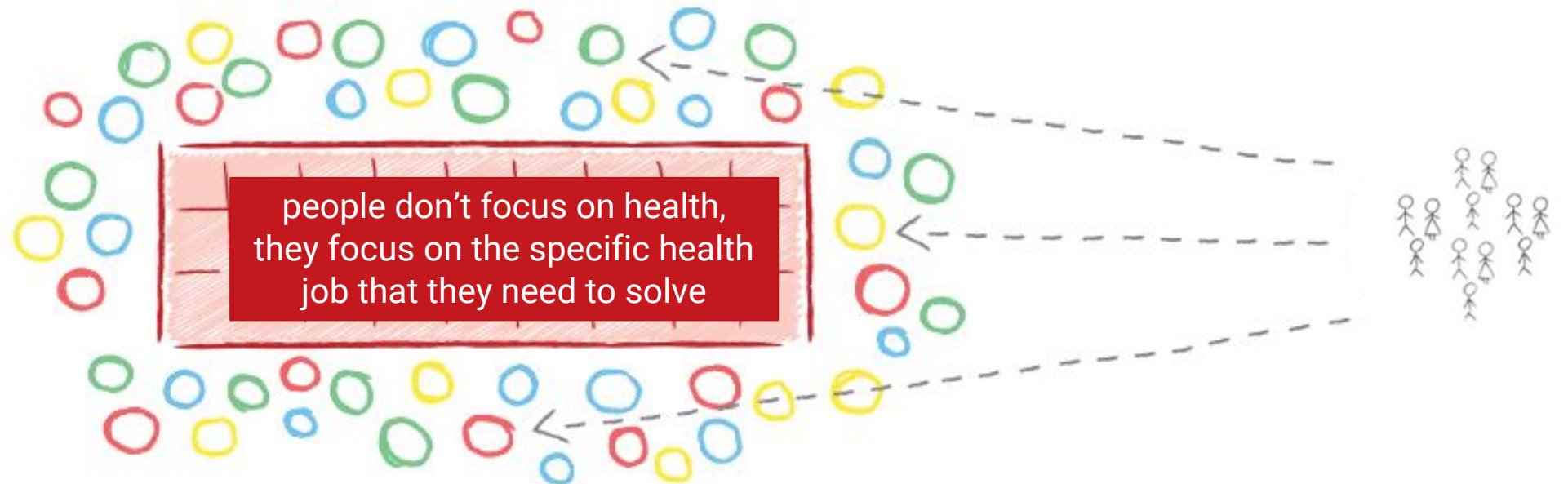
First
Principles:

Health Jobs



INDIVIDUAL HEALTH JOBS

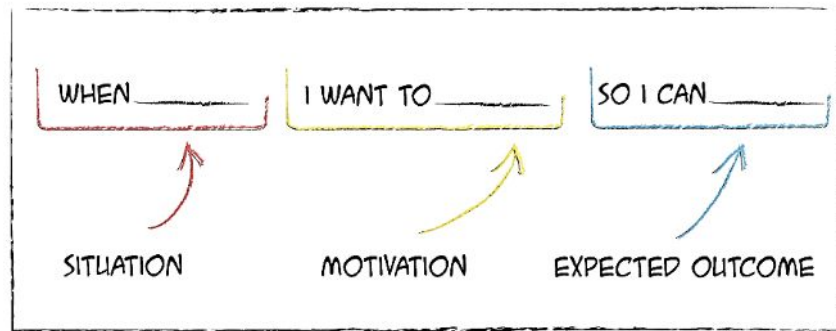
All H.W.B. activities are made up of a collection of discrete tasks, and we believe that individual apps / services will emerge to solve individual health, wellness and betterment (HWB) jobs.



HEALTH JOBS = Jobs to be Done



HEALTH JOBS = Jobs to be Done



- When I have a mole, I want to know whether it is serious or not, so that I can stay well
- When I have diabetes, I want to control my blood sugars, so I can avoid complications
- When I have high blood pressure, I want to control my blood pressure, so I can avoid having a stroke
- When I have a sore throat, I want to know whether it is bacterial or viral, so I can take antibiotics if I need them
- When I have a headache, I want to know if it is serious, so I can effectively treat it as soon as possible
- When I have cancer, I want the best treatment, so that I can stay alive as long as possible
- When I break a bone, I want the best treatment, so that I can fully heal, as quickly as possible
- When I need a surgery, I want to be as prepared as possible, so that I can heal as quickly as possible



HEALTH JOBS – Diabetes Example

Goals of Diabetes Management

Prevent complications and death from:

Blood sugar control

- Hyperglycemia
- Diabetic ketoacidosis
- Hypoglycemia

Microvascular

- Retinopathy
- Neuropathy
- Nephropathy

Macrovascular

- Coronary Artery
- Peripheral Vascular

Infections

Co-morbidities

- hearing impairment
- sleep apnea
- fatty liver disease
- periodontal disease
- cognitive impairment,
- depression, and
- fractures

Health Jobs – Diabetes Example

Health Jobs	Consumer Health Jobs	Healthcare Provider Health Jobs
Monitor and Control Blood Sugars	<ul style="list-style-type: none">• Monitor blood sugars• Modify diet• Modify exercise	<ul style="list-style-type: none">• Monitor HbA1c• Insulin management• Pharmacotherapy
Monitor and Control Risks for Complications of DM	<ul style="list-style-type: none">• Monitor weight (weight reduction)• Monitor BP• Monitor activity• Stop smoking	<ul style="list-style-type: none">• Monitor lipids• Monitor BP• Monitor renal function• Immunizations (Influenza, Pneumococcal, Hepatitis B)
Screening and Early Diagnosis of Complications and Co-morbidities	<ul style="list-style-type: none">• Foot exam	<ul style="list-style-type: none">• Retinal exam (retinopathy)• Foot exam (neuropathy)• Dental exam• Depression screening

Health Jobs – Diabetes Example

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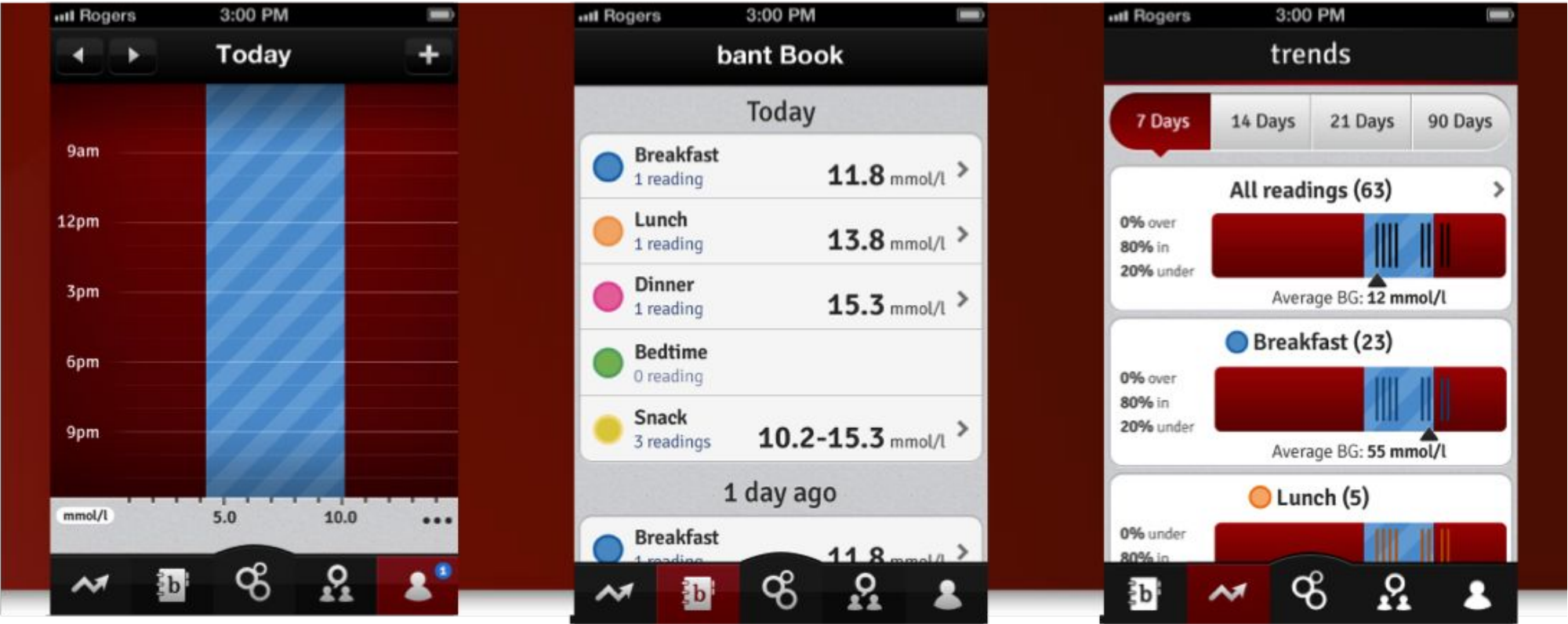
Evolution of a Health Job – Monitoring Blood Sugars



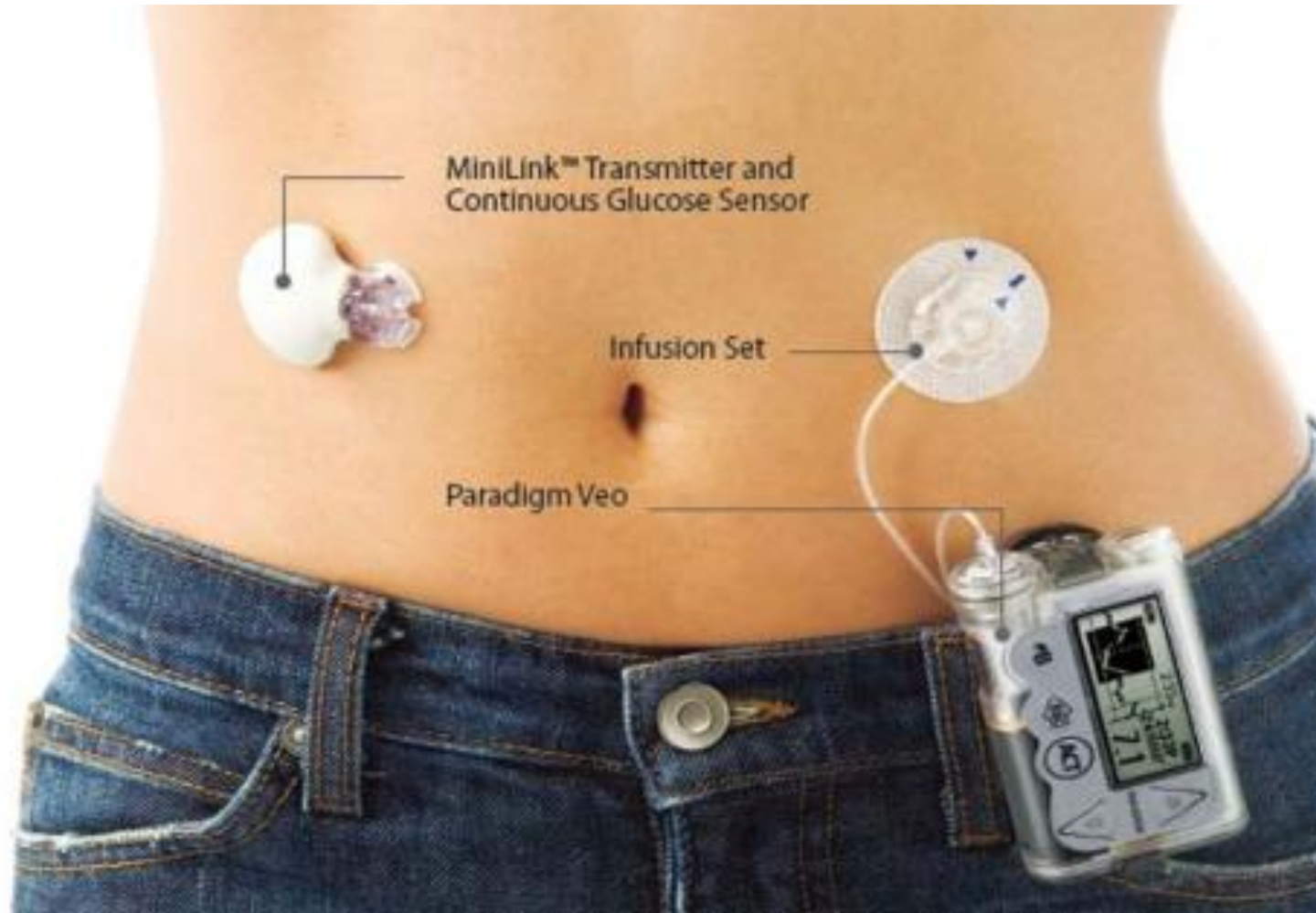
Evolution of a Health Job – Monitoring Blood Sugars



Evolution of a Health Job – Monitoring Blood Sugars



Evolution of a Health Job – Monitoring Blood Sugars





Why Health Professionals are Needed for Health Jobs

Safety

Why Health Professionals are Needed for Health Jobs




Cost

A photograph of a surgical team performing an operation. The surgeons are wearing blue scrubs and white gloves, and are focused on the patient. The operating room is brightly lit, and various surgical instruments are visible. The text "Why Health Professionals are Needed for Health Jobs" is overlaid on the top half of the image.

Why Health Professionals are Needed for Health Jobs

Technical Ability

Why Health Professionals are Needed for Health Jobs

A close-up photograph of a hand holding a reflex hammer. The hammer has a circular metal head and a blue handle. The background is blurred, showing a person wearing a white medical mask and a blue stethoscope, suggesting a healthcare setting.

Confidence

Why Health Professionals are Needed for Health Jobs

1. Safety
2. Cost
3. Technical Ability
4. Confidence

Digital Health will increasingly lower these barriers, while providing earlier diagnoses and preventive measures

Why Health Professionals are Needed for Health Jobs



Empathy

Evolution of a Health Job – Monitoring Blood Sugars

Evolution of a Health Job – Monitoring Blood Sugars

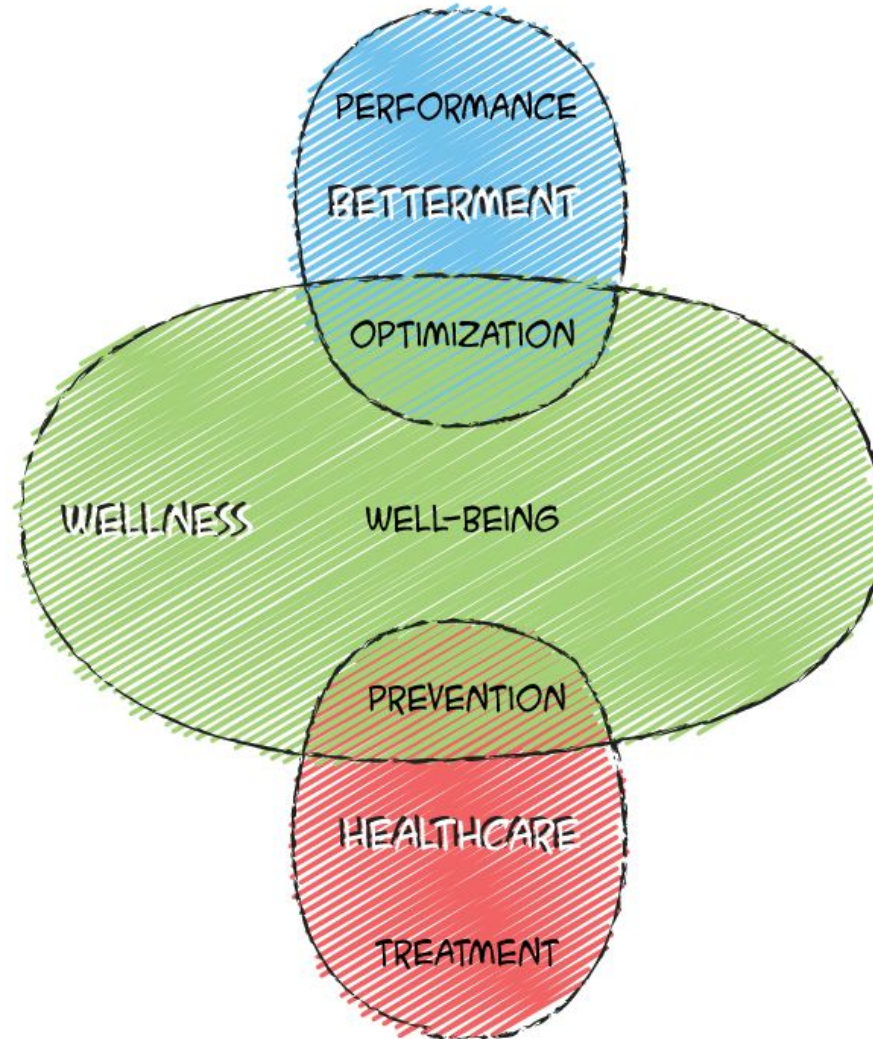
Eventually health jobs can be made obsolete by:

- Cure
- Prevention
- Remission
- Reversal

First
Principles:

Health, Wellness & Betterment

Health is more than
the absence of
disease...

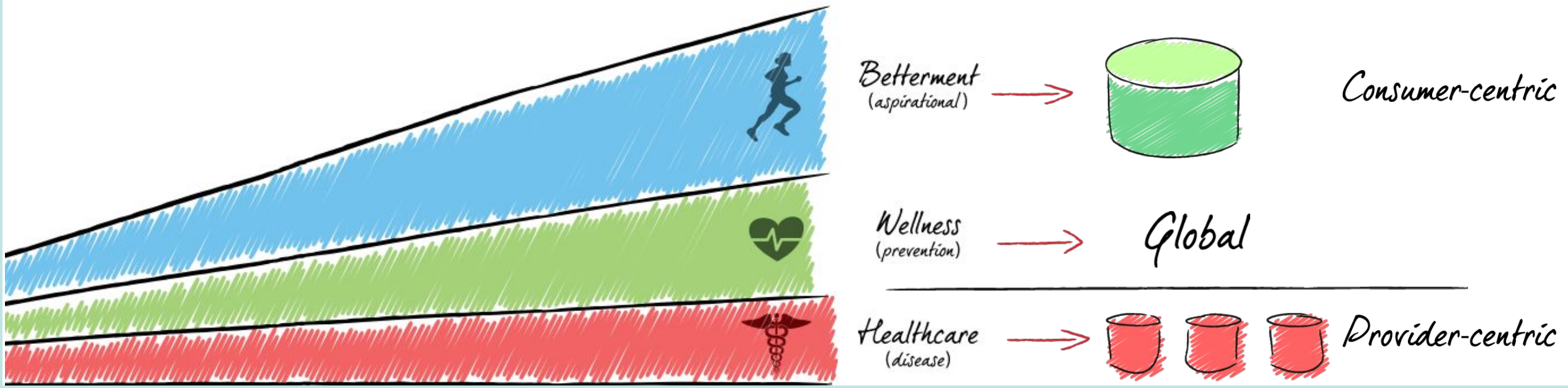


...it is a state of
complete physical,
mental and social
well-being



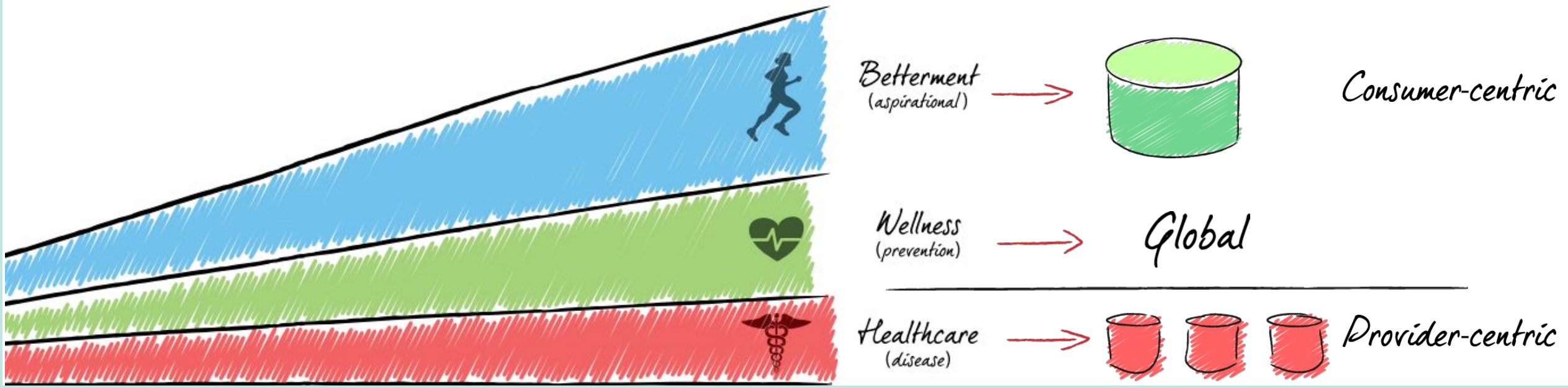
HEALTHCARE, WELLNESS & BETTERMENT

Our work has convinced that the traditional view of 'healthcare' makes it difficult to envision the full scope of impact from digitization.



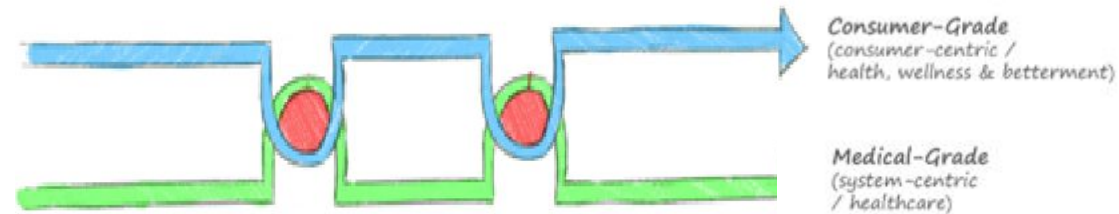
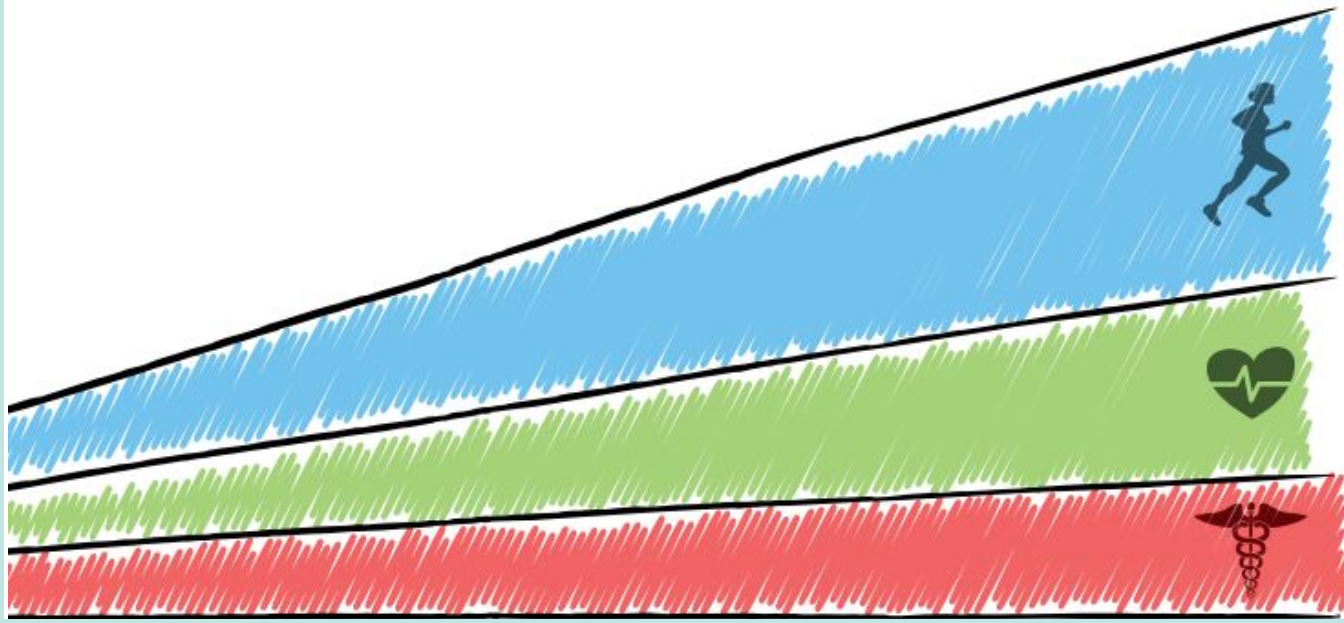
THE COMPLIANCE PENALTY

App's, Services and Platforms that restrict themselves to health (ie: exclude wellness & betterment), are at a significant disadvantage because they will be unable to match the growth users, data & iteration of their competitors who operate on both sides of the line.



THE COMPLIANCE PENALTY

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First
Principles:

Digitization changes everything

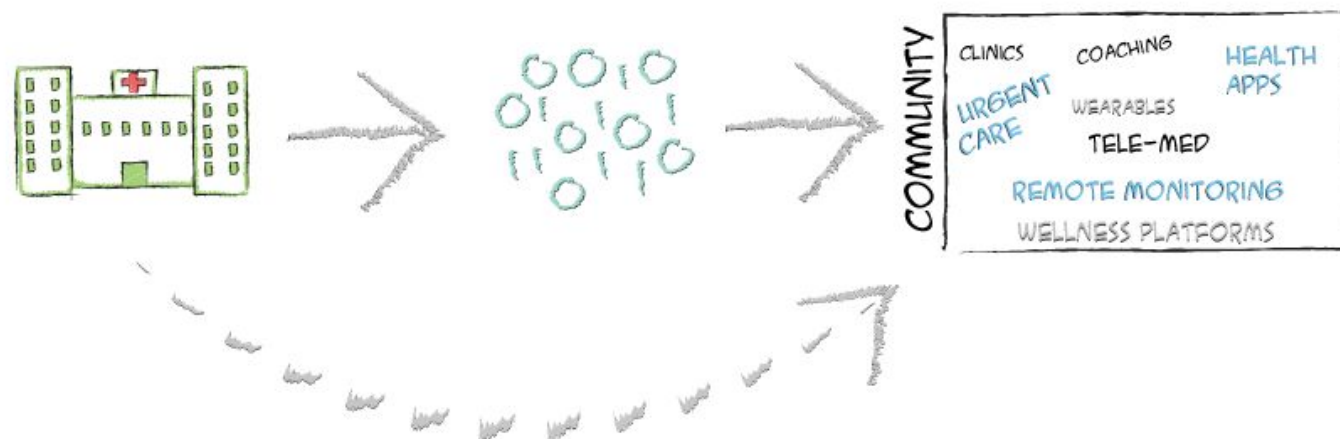


DIGITIZATION of HEALTH

Sometimes lost in the implementation horror stories and lengthy time to market are the capabilities that DIGITAL brings to an industry:

Reimaging processes transcending

- ***Time***
- ***Distance***
- ***Presence***



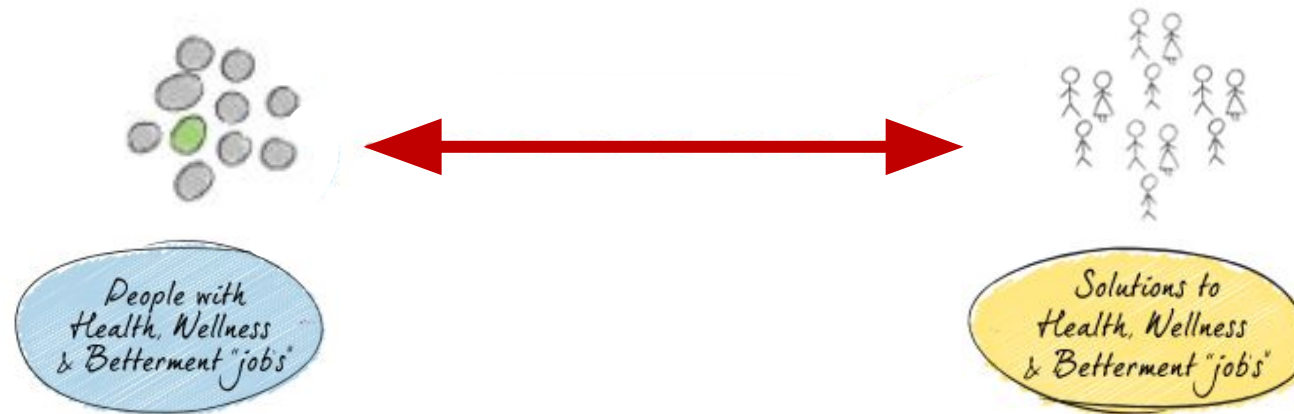
First
Principles:

Platforms



PLATFORMS ARE INEVITABLE

We have come to believe that H.W.B. has so much friction that it's inevitable for platforms to emerge. In addition to typical platform functions, they will be expected to make it easy for apps and services to access data silos and to remain compliant with all of the rules around privacy, security, encryption etc.

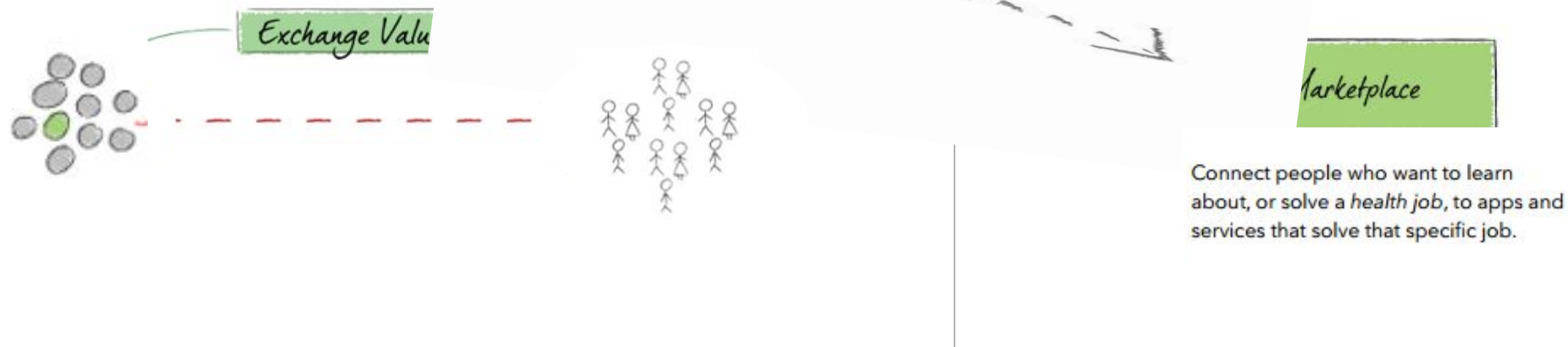




PLATFORMS HAVE 3

JOBS

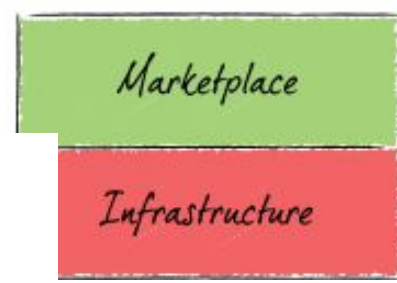
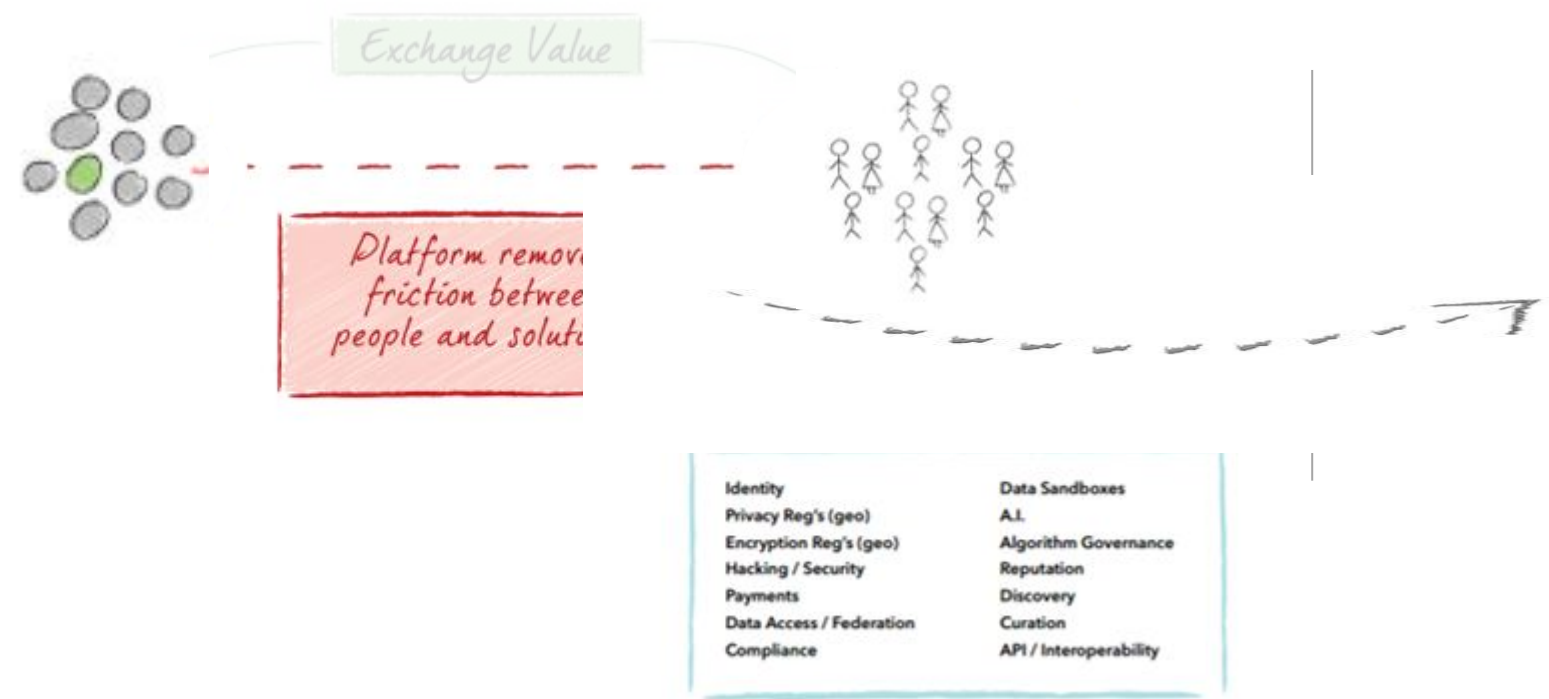
1. ENCOURAGE VALUE EXCHANGE





PLATFORMS HAVE 3 JOBS

1. ENCOURAGE VALUE EXCHANGE
2. REMOVE FRICTION



Identity / Privacy / Security / Compliance
Payments / A.I. Sandbox / Discovery
Reputation / Governance / Community / API

Data Access / Interoperability / Federation
Portability / Compliance / Privacy / Attribution
/ encryption / Micro-payments / Privacy Reg's



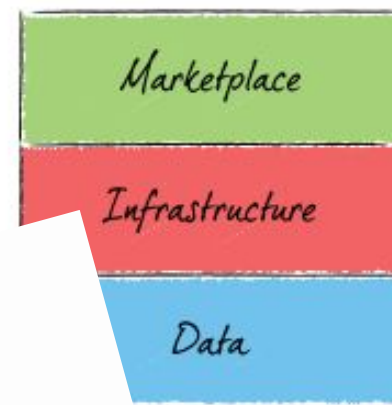
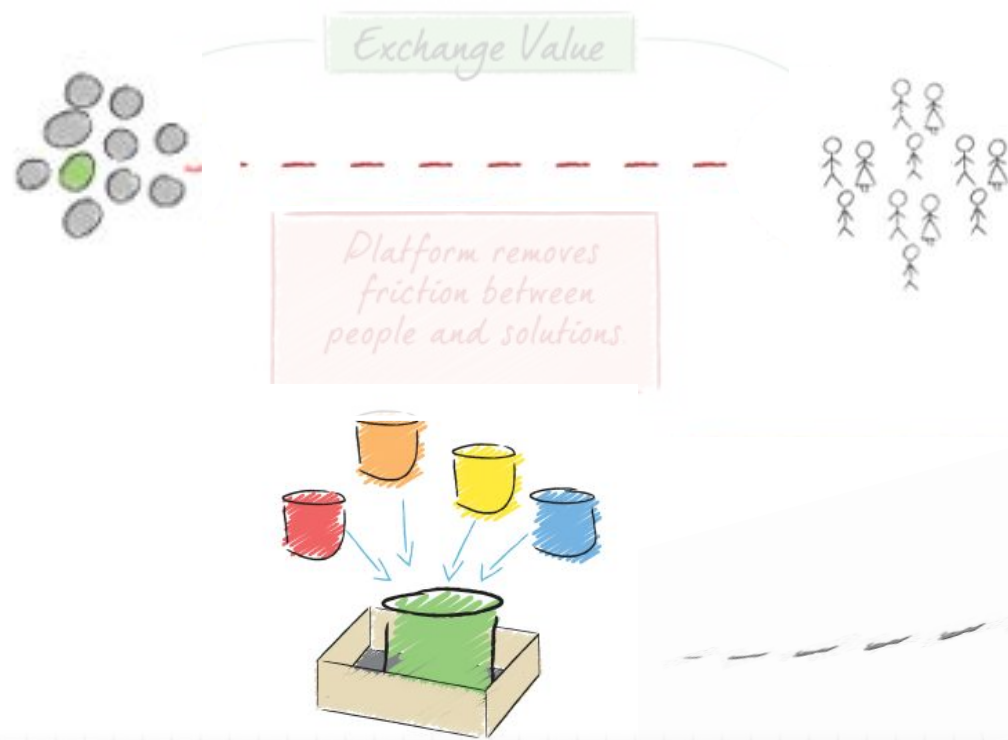
PLATFORMS HAVE 3

JOBS

1. ENCOURAGE VALUE EXCHANGE

2. REMOVE FRICTION

3. **PLATFORM DATA** (meta)



Data Access / Interoperability / Federation
Portability / Compliance / Privacy / Attribution
/ encryption / Micro-payments / Privacy Reg's



Your Health Journey

Take
Control

Have Confidence

Optimiz
e



Your FIRST Health Job



Your **FIRST** Health Job

Know where you
are





Your **FIRST** Health **Job**

7 Numbers You Should
Know

1. BP
2. FBS/HbA1c
3. TG/HDL
4. GGT
5. CRP
6. A:G Ratio
7. Vitamin D

Thank
You