KTN

David Calder – Digital Health
February 2019

Innovate UK
Knowledge Transfer Network

ktn-uk.org @KTNUK

UK Innovation Landscape

KTN's Mission

(Who we are & why we exist)

KTN is the UK's innovation network.

Our mission is to deliver economic growth. We connect people to speed up innovation, solve problems and find markets for new ideas.

We bring together businesses, entrepreneurs, academics and funders to develop new products, processes and services.

UK Economic Growth

KTN The UK's Innovation Network

Businesses, Entrepreneurs and Investors

Technologies, Inventions and Creativity
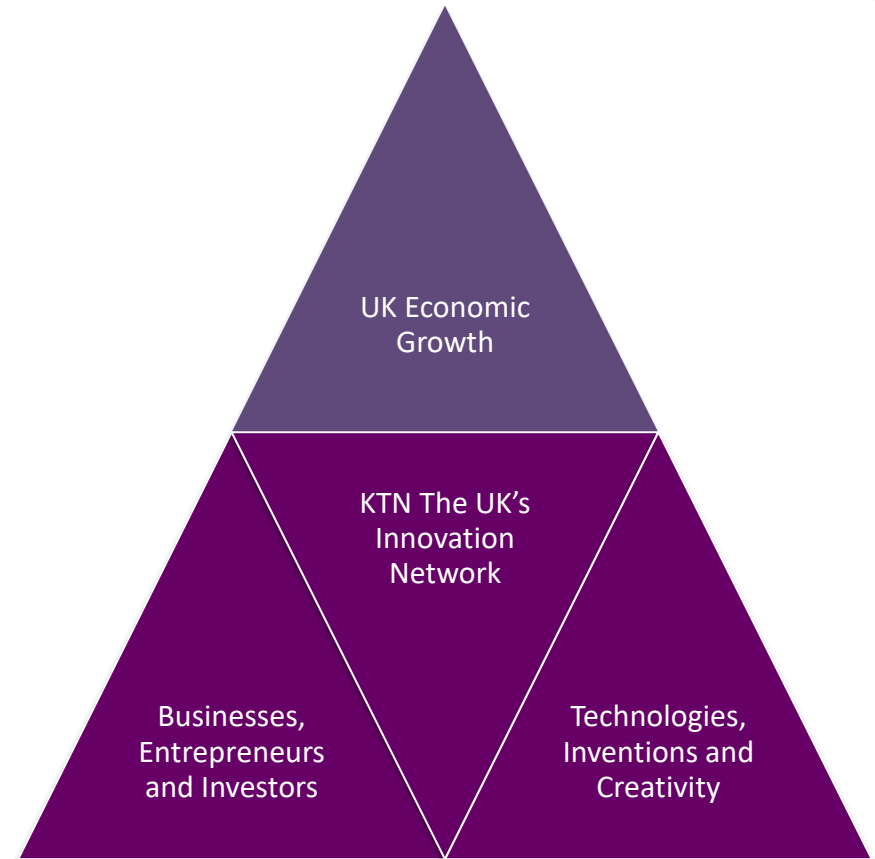
KTN Objectives

- Increase business led R&D

- Facilitate exploitation of R&D to capture more UK value from innovation

- Increase collaboration between businesses (B2B) & between businesses and the research base (B2R) for UK benefit

- Be the strategic partner of choice for innovation networking

- Provide breadth and depth of expertise for businesses looking to innovate

Breadth of expertise

**Chemistry & IB
Materials
Agri-Food
Health**

**Manufacturing
European & International
Diversity
Design & Innovation
Access to Funding & Finance**

**KT Advisers
Communications
Events
Finance and Ops**

**Emerging Tech
Enabling Tech
Creative & Digital
Infrastructure
Transport
Complex Systems**

Innovate UK
Knowledge Transfer Network

How it works

— Attend events

— Receive expert advice & insights

— Get help with crossing sectors

— Introductions to new collaborations
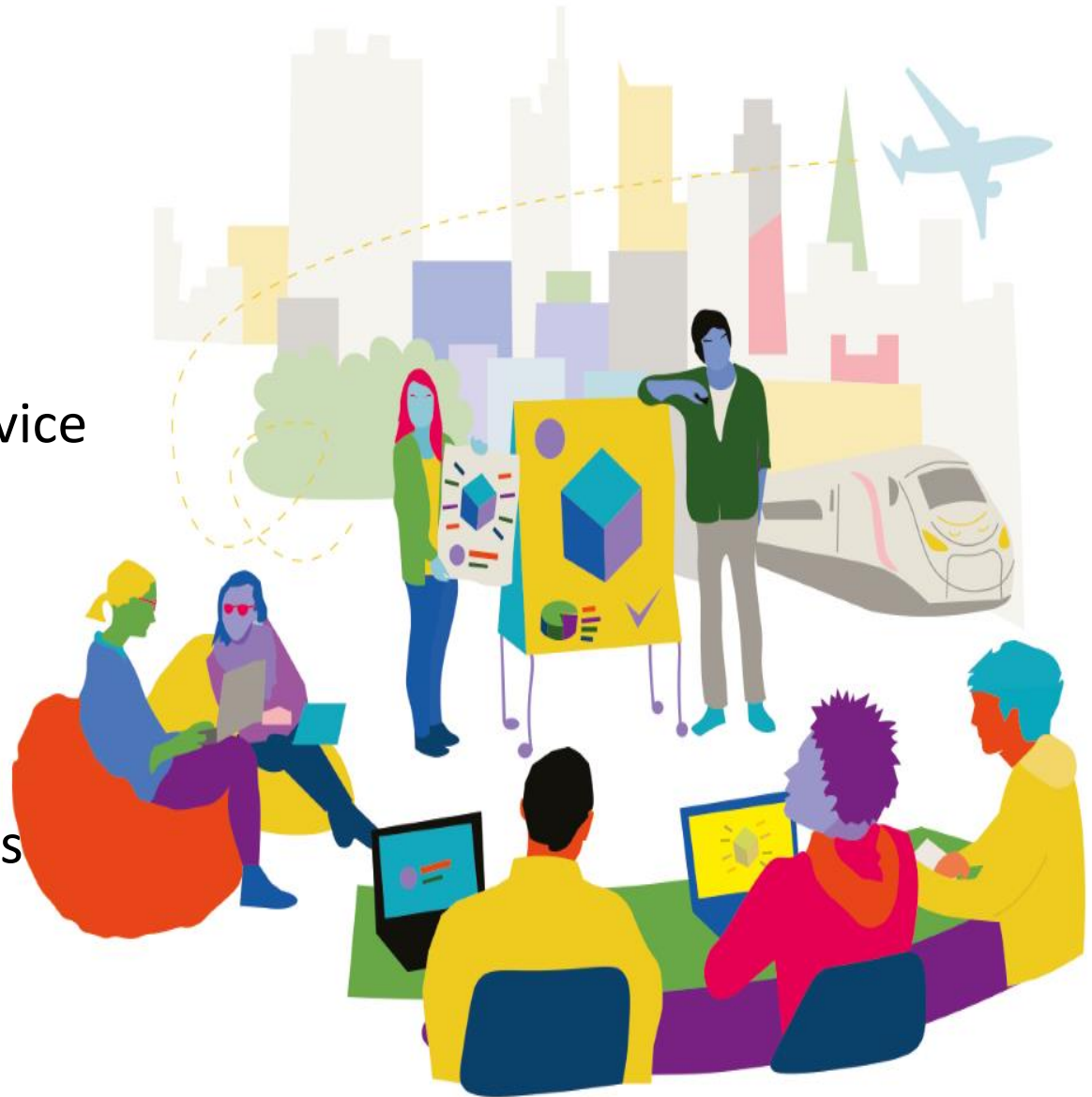
2017-18 Stats

- ~ 3000 new introductions
- 442 new collaborations
- ~ 59500 newsletter subscribers
- 383 events
- ~ 26400 delegates

5 foundations of productivity

Ideas
the world's most innovative economy

People
good jobs and greater earning power for all

Infrastructure
a major upgrade to the UK's infrastructure

Business environment
the best place to start and grow a business

Places
prosperous communities across the UK

INDUSTRIAL STRATEGY

Commit to reach 2.4% of GDP investment in R&D by 2027

Industrial Strategy Challenge Fund

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Innovate UK

- ## ISCF & The Grand Challenges

The Industrial Strategy Challenge Fund (ISCF) aims to bring together the UK's world leading research with business to meet the major industrial and societal challenges of our time.

AI and Data Economy

Ageing Society

Clean Growth

Future of Mobility

Innovate UK

- Industrial Strategy Challenge Fund

Wave 1	Wave 2	Wave 3
Healthcare & medicine - DHTC	Transforming Construction	
Robotics & AI	**Data to early Diagnosis & Precision Medicine**	
Driverless Vehicles	Transforming Food Production	
Manufacturing & Materials of the Future	Next Generation Services	Business cases being finalised
Satellites & Space technology	Prospering from the Energy Revolution	
Clean & Flexible Energy	**Healthy Ageing (tbc)**	
	Audience of the Future	
	Quantum Technology	

ISCF Wave 3 Announced Challenges

- <u>Ageing Society</u>

- Accelerated Detection of Disease

- <u>Clean Growth</u>

- Industrial Decarbonisation Challenge

  - ➤ *End of process, clusters*

- Transforming Foundation Industries

  - ➤ *Materials and innovations in the process, heavy industry*

- Smart Sustainable Plastic Packaging

- <u>AI and Data Economy</u>

- Manufacturing Made Smarter

- Commercialising Quantum Technologies

- <u>Future of Mobility</u>

- Future Flight Challenge

- Driving the Electric Revolution

KTN Health (Life Sciences)

Medicines
- Discovery and development
- Scale-up and manufacture

Med Tech
- In vitro technologies (including wearables)
- Implantable technologies

Digital
- Systems for diagnosis/remediation of disease
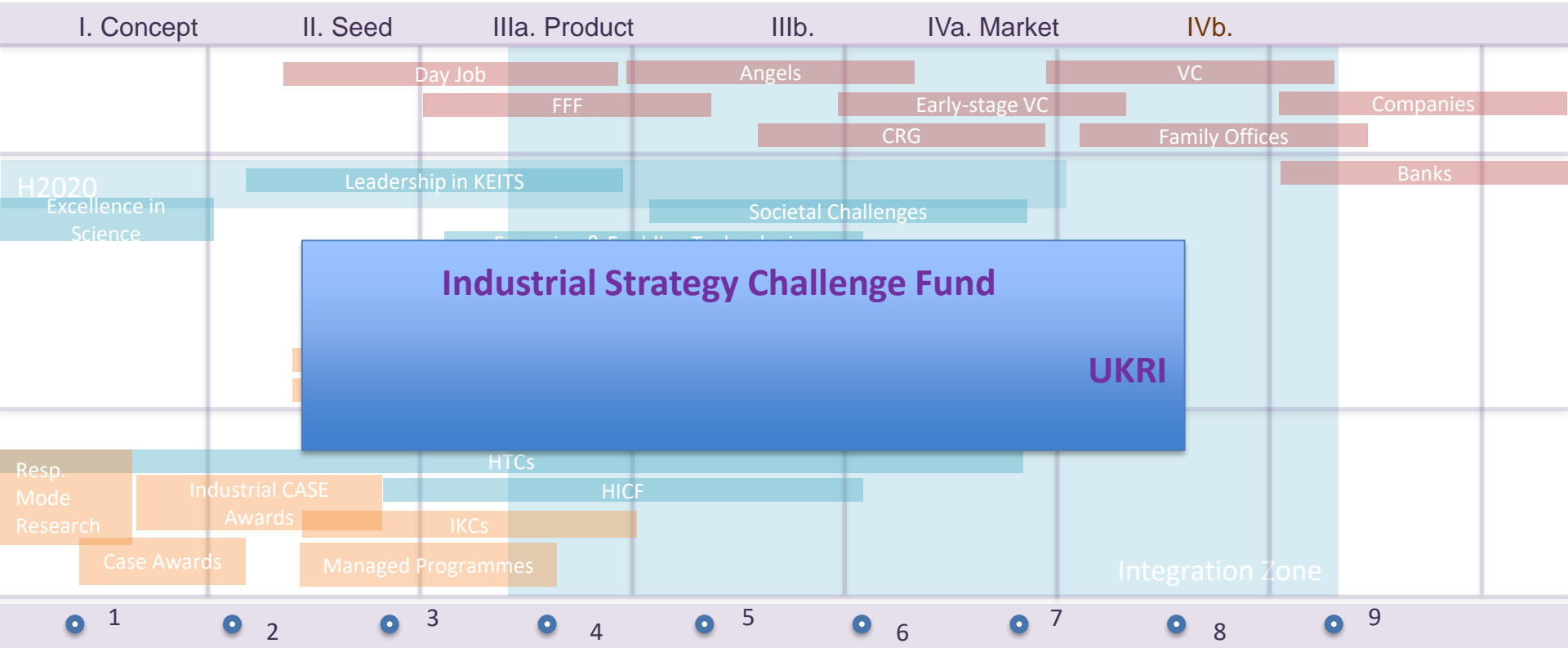- Data in health & care

KTN Health Priorities

Establish and maintain the UK as the best place to drive health innovation

Foster a collaborative approach wherever appropriate

Develop and support specific interventions for diverse markets

Understand the innovation landscape

Companies

Stakeholders

SMEs

Large Companies

Numerous
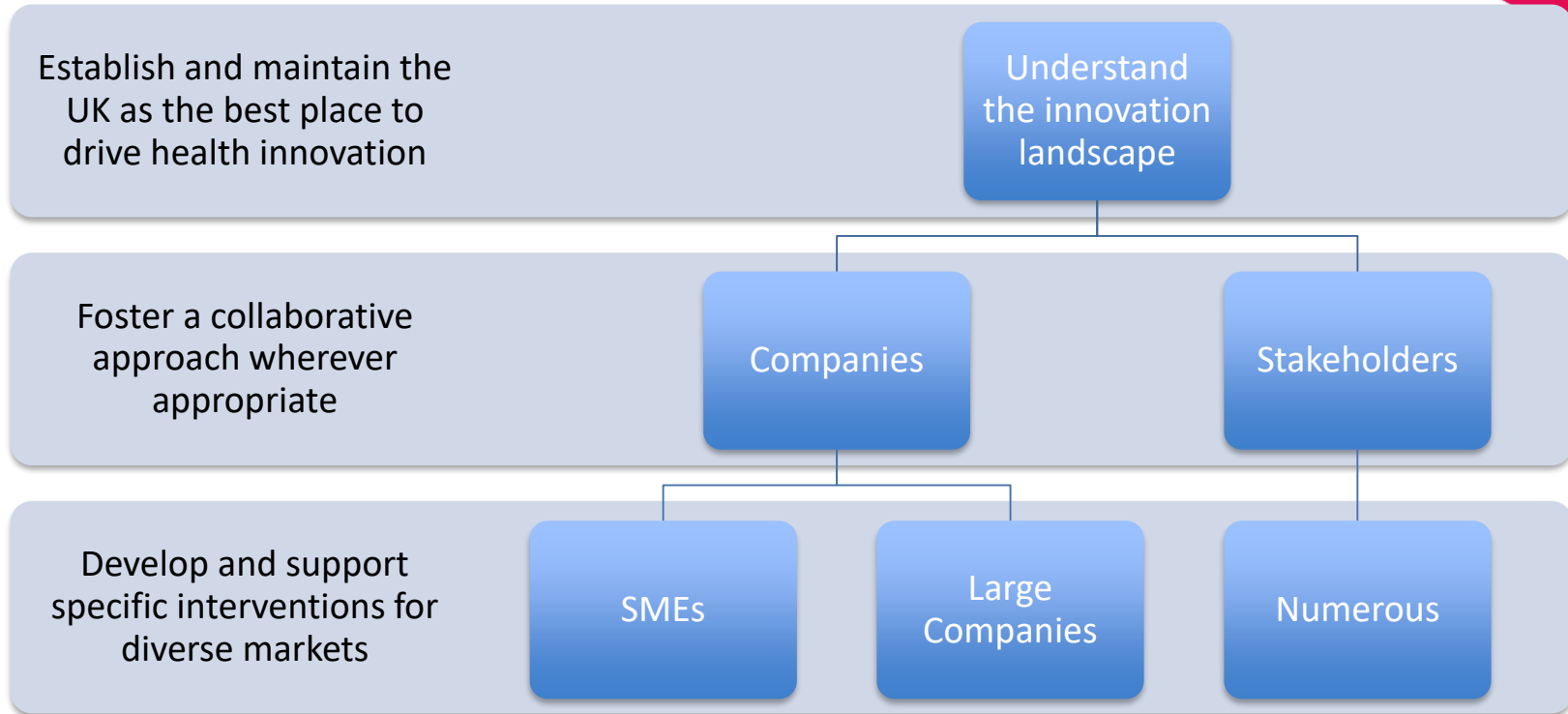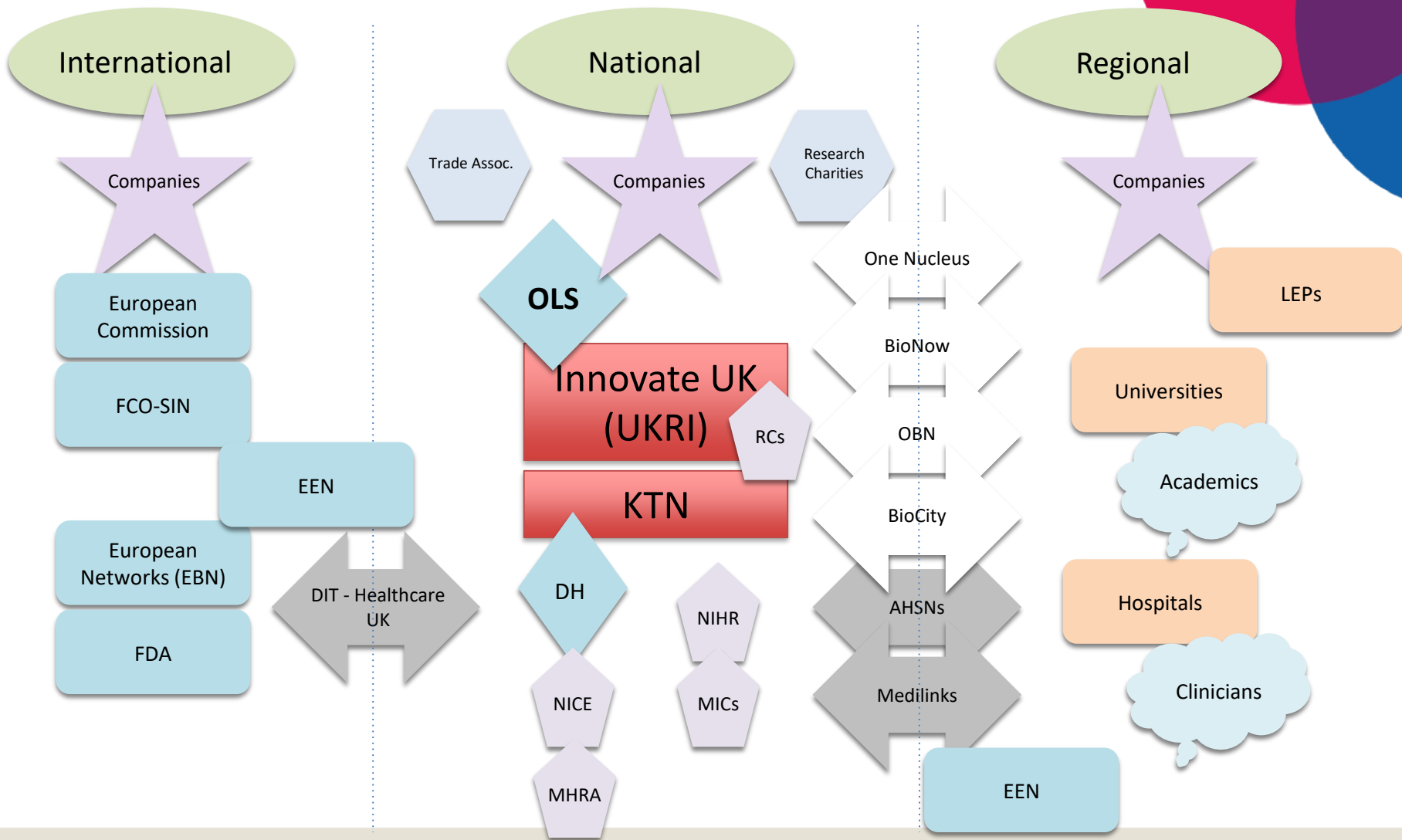
KTN Health Team Support for Business

- Access to grants (all relevant grants) and assets
- Access to funding and finance (private finance)
- Building the best consortium
- Building the best application
- Connecting through a supply chain (B2B, A and C)
- Connecting across sectors and technologies
- Signposting through innovation landscape
- Awareness of new market opportunities
- International innovation opportunities (Newton, Prosperity, Expert Missions)

KTN Health Typical Month

- Approx 50 business visits
- 1-4 Innovate UK/KTN events (deep-dives, competition briefings, consortia building, community building)
- Review of proposals
- Leadership Council support (MMIP, but also IBLF, SBLC, AMLC, CGP, etc.)
  - Advanced Therapies Task Force
- Government support
  - SBRI (EAHSN)
  - NIHR – MICs
  - NHSE – AHSNs
  - DAs – Scotland, Wales and Northern Ireland

Innovation Funding

Integrated Public / Private Funding Strategy – Health Focus

I. Concept	II. Seed	IIIa. Product	IIIb.	IVa. Market	IVb.

Day Job

Angels

VC

FFF

Early-stage VC

Companies

CRG

Family Offices

H2020

Banks

Excellence in Science

Leadership in KEITS

Societal Challenges

Industrial Strategy Challenge Fund

UKRI

Resp. Mode Research

HTCs

Industrial CASE Awards

HICF

IKCs

Case Awards

Managed Programmes

Integration Zone

1 2 3 4 5 6 7 8 9

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Digital Health Technology Catalyst R4

- £5m available (typical projects £300k to £1m)

- Opened February 11th (for 6 weeks)

- UK SME's must lead – MUST be collaborative

- No Feasibility Study stage in round 4

- Funded support from NICE and DataLab to help projects add value

- Typical Tech – AI, VR & AR, IoT enabled, informatics and data analytics

Digital Health Technology Catalyst R4 Scope (includes but not limited to)

- Clinical decision support

- Systems that improve access to healthcare or treatment compliance

- Enable patient led management

- Digital technologies and products which help overcome privacy challenges of managing, sharing and exploiting data

- Projects addressing the patient-led experience from prevention, through diagnosis, treatment and recovery, to long-term care

- Applications of technology to health challenges where digital solutions offer and can demonstrate significant improvements in quality, speed, cost, outcomes and learning

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Questions?

David Calder
Health and Care
Knowledge Transfer Network

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Innovate UK: Healthy Ageing

- Call has been delayed, perhaps until Summer 2019
- Various reasons but suspect a combination of factors including insufficient industry interest, too complex, too much risk
- Still have £98m
- Still 3 years (from 1st April'19)
- Planning a quick survey to inform the business case (for the call)
- Maybe see a larger number of projects/a different dynamic
- Are really keen to make it work, not just about getting the £s out

- Healthy Ageing Innovation Cluster & this Ecosystem for updates
- To join the Cluster contact DHI at **support@dhi-scotland.com**
- **http://dhi-scotland.com/healthy-ageing-innovation-cluster/**

Karen O'Hanlon, Business Development Manager, SRHP

SRHP@uhi.ac.uk

www.uhi.ac.uk/SRHP

- **Don't miss out, become a SRHP member today!**

Healthy Aging
A Highlands and Islands perspective

Prof Sandra MacRury

Academic Lead SRHP

What does healthy aging mean ?

Disability
Diabetes
Depression
Dementia

Balanced Diet
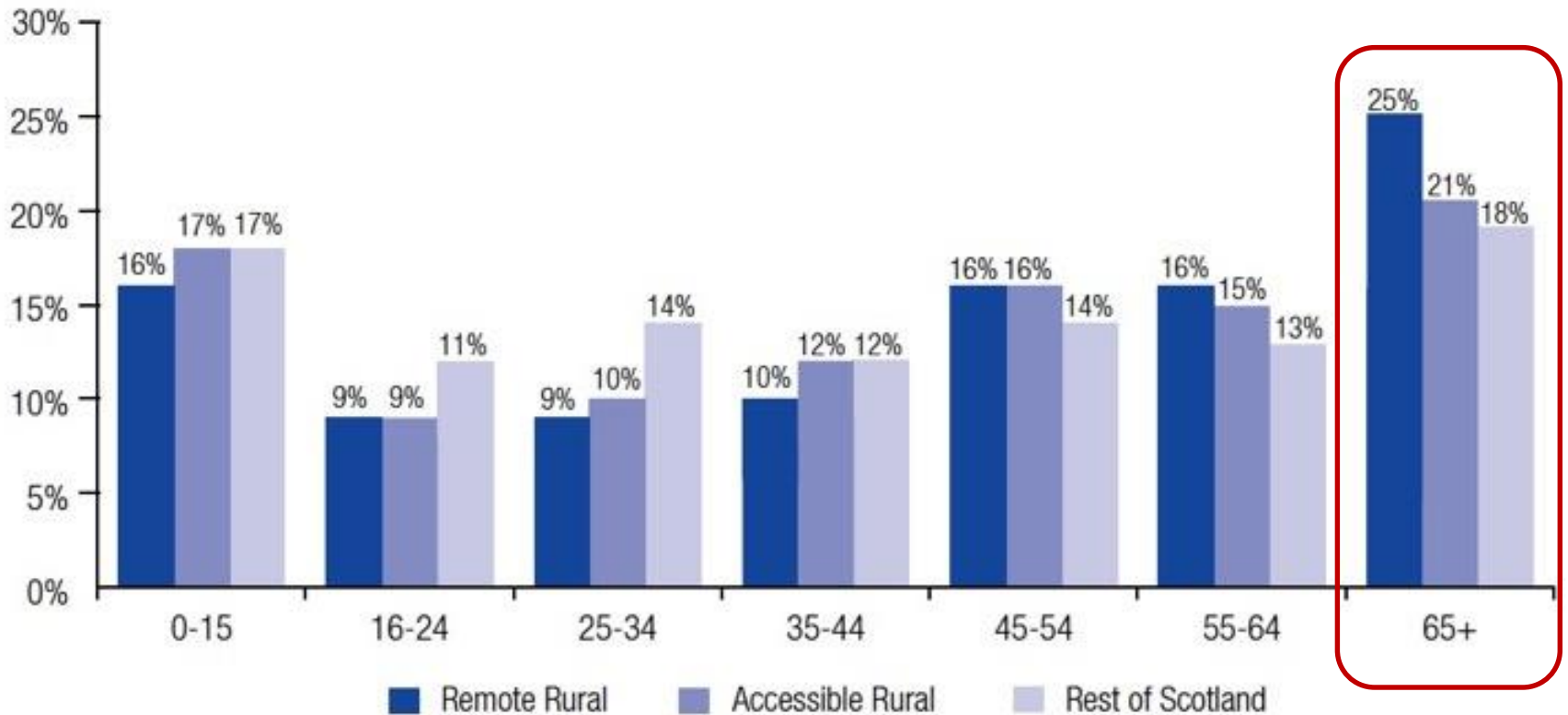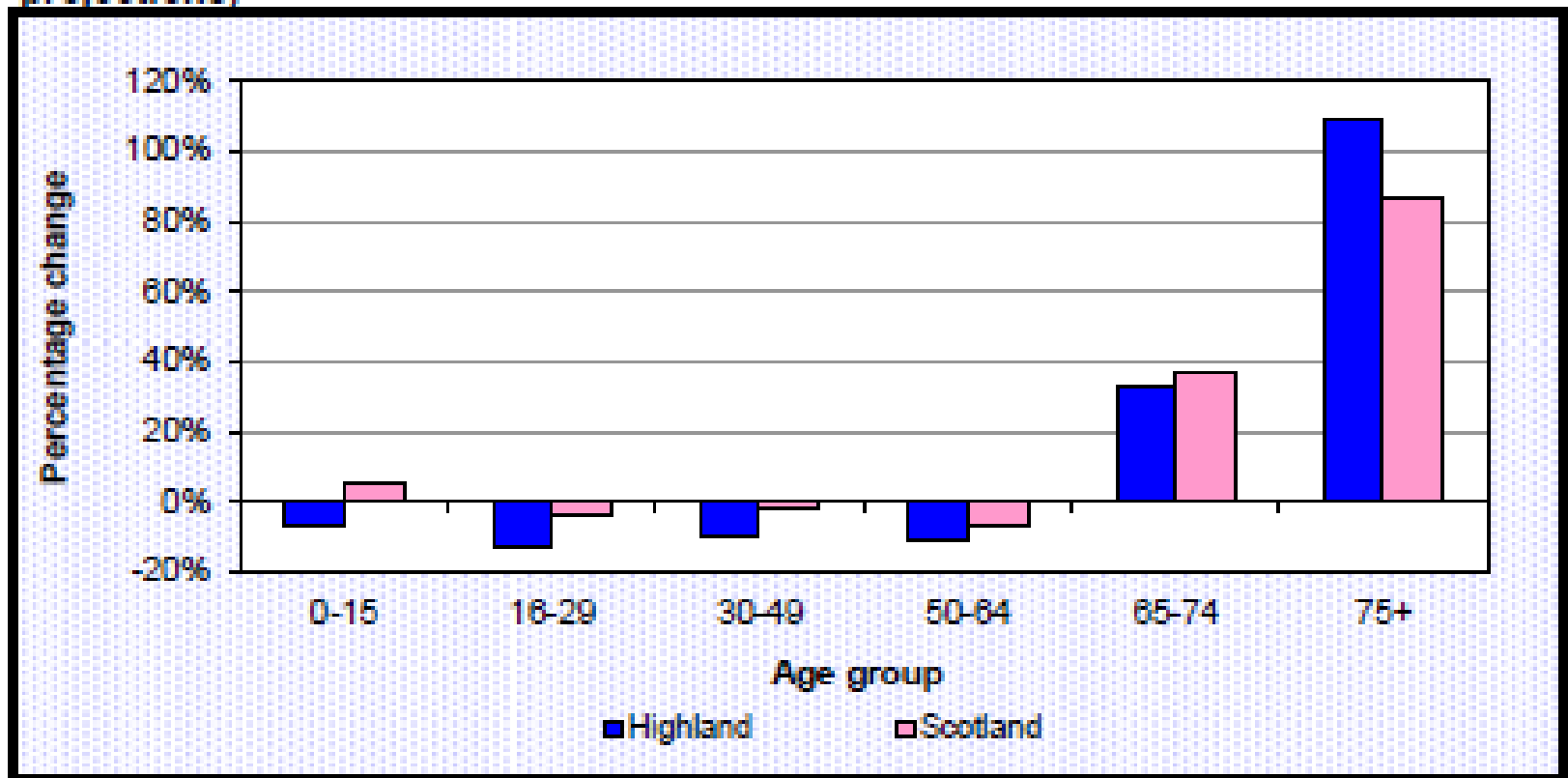Physical activity
Social interaction

Obesity
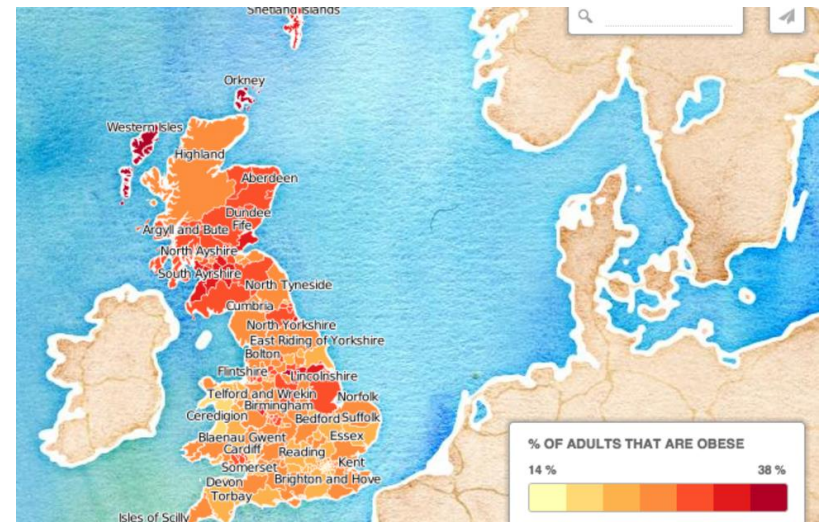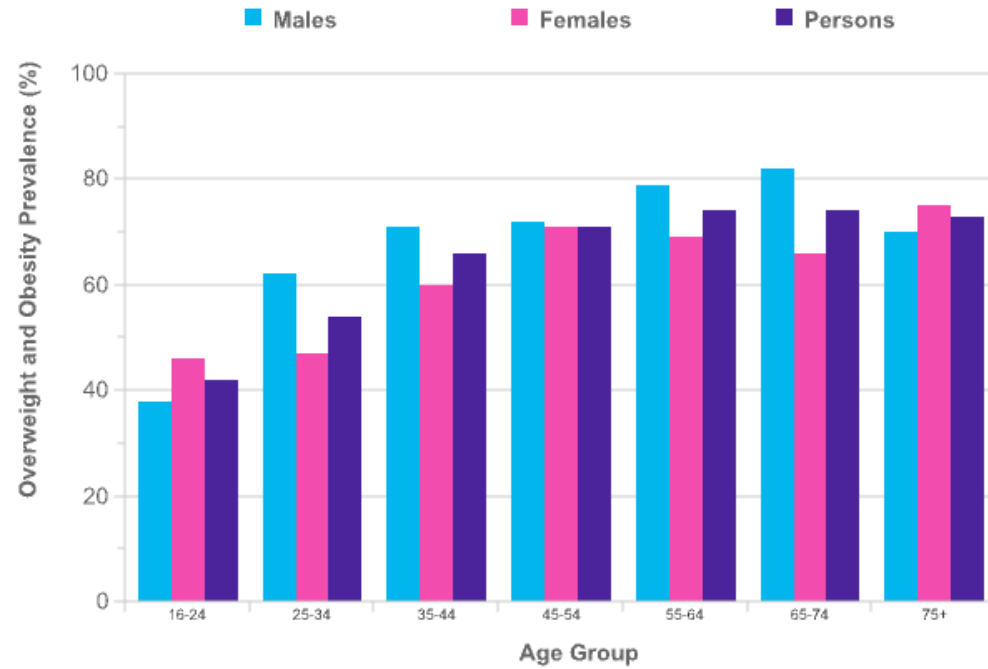
Aging and Obesity
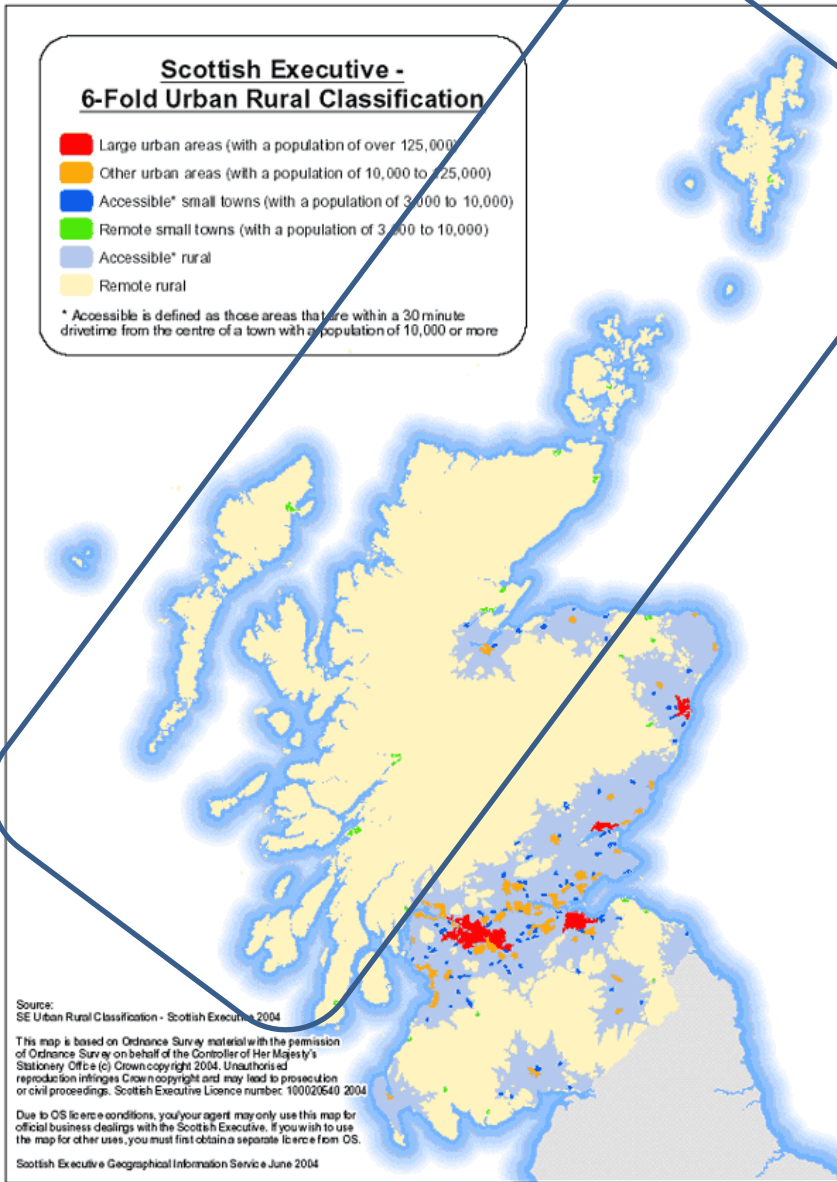
- Diabetes
- Dementia
- Cancer
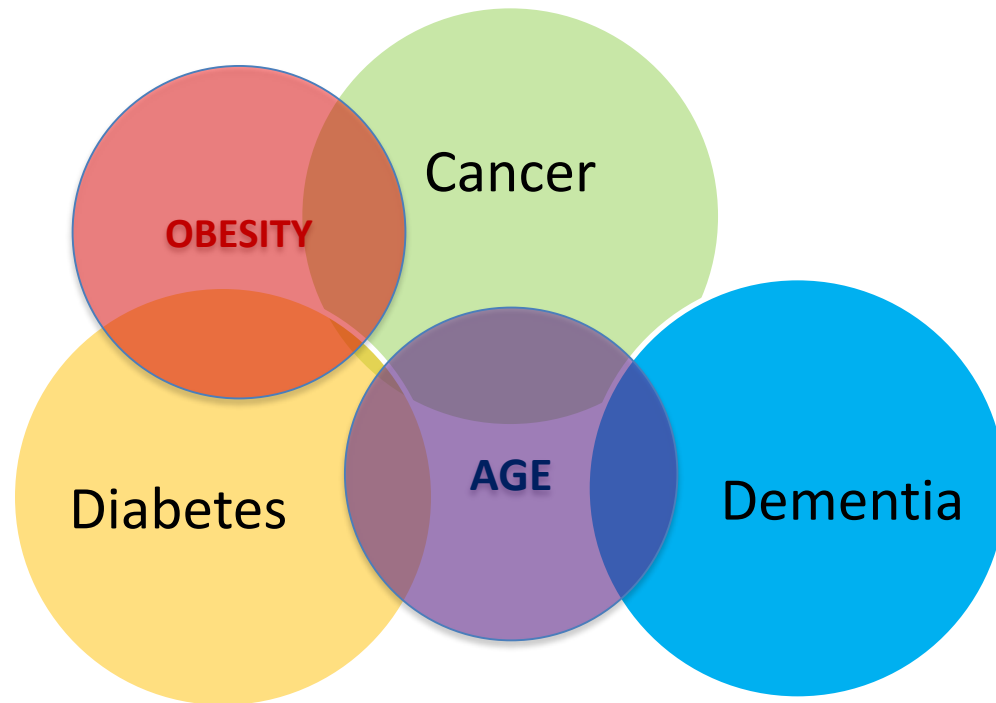
Demographic

Percentage change in population in Highland and Scotland, 2012-2037 (2012-based projections)

The Annual Report
of the **Director of
Public Health**

NHS
Highland

2016

**Loneliness
and Health**

**Public
Health**

**Dementia-friendly rural
communities guide**

A practical guide for
rural communities to
support people affected
by dementia

**Alzheimer's
Society**

United
Against
Dementia

Physical and Mental Wellbeing
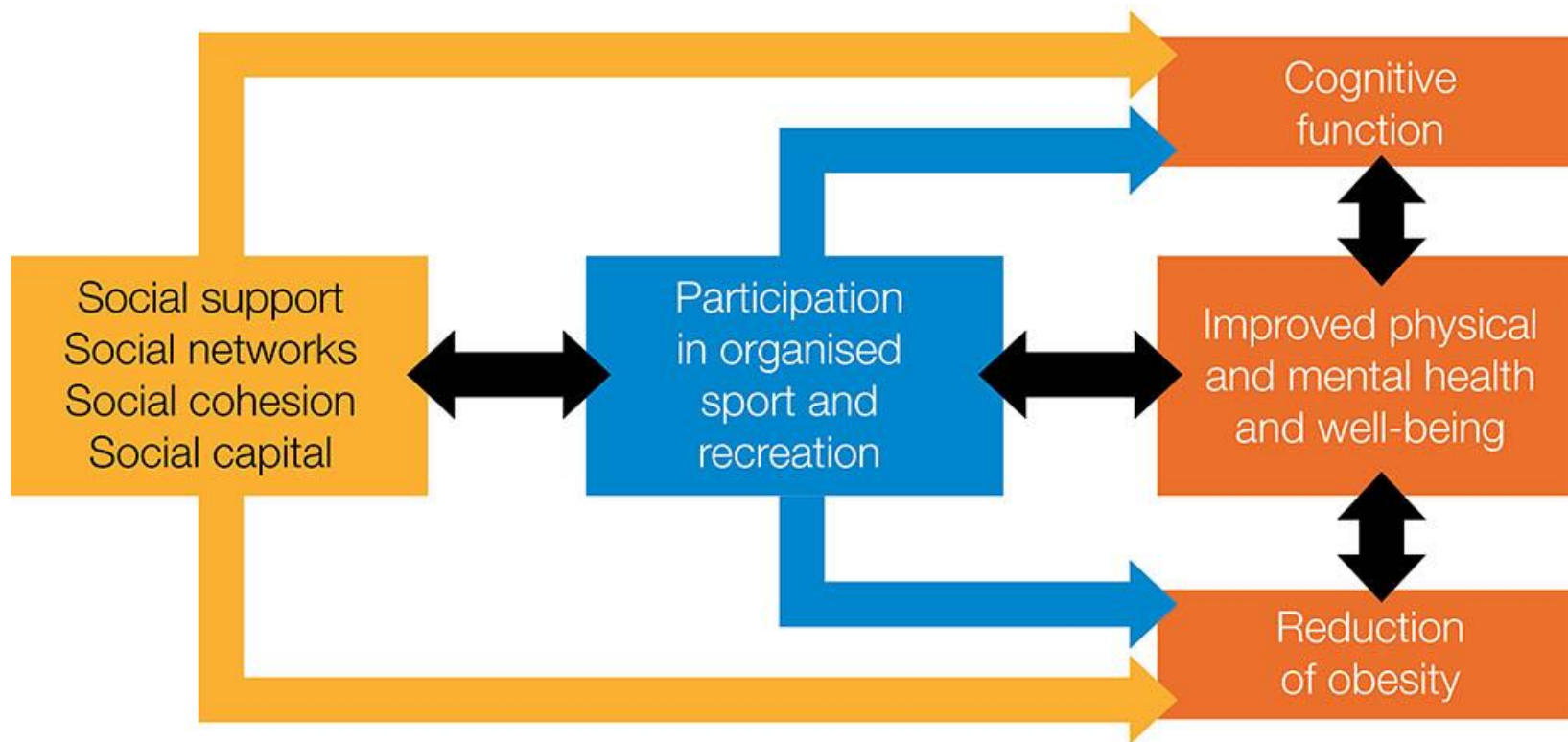
Rural Context
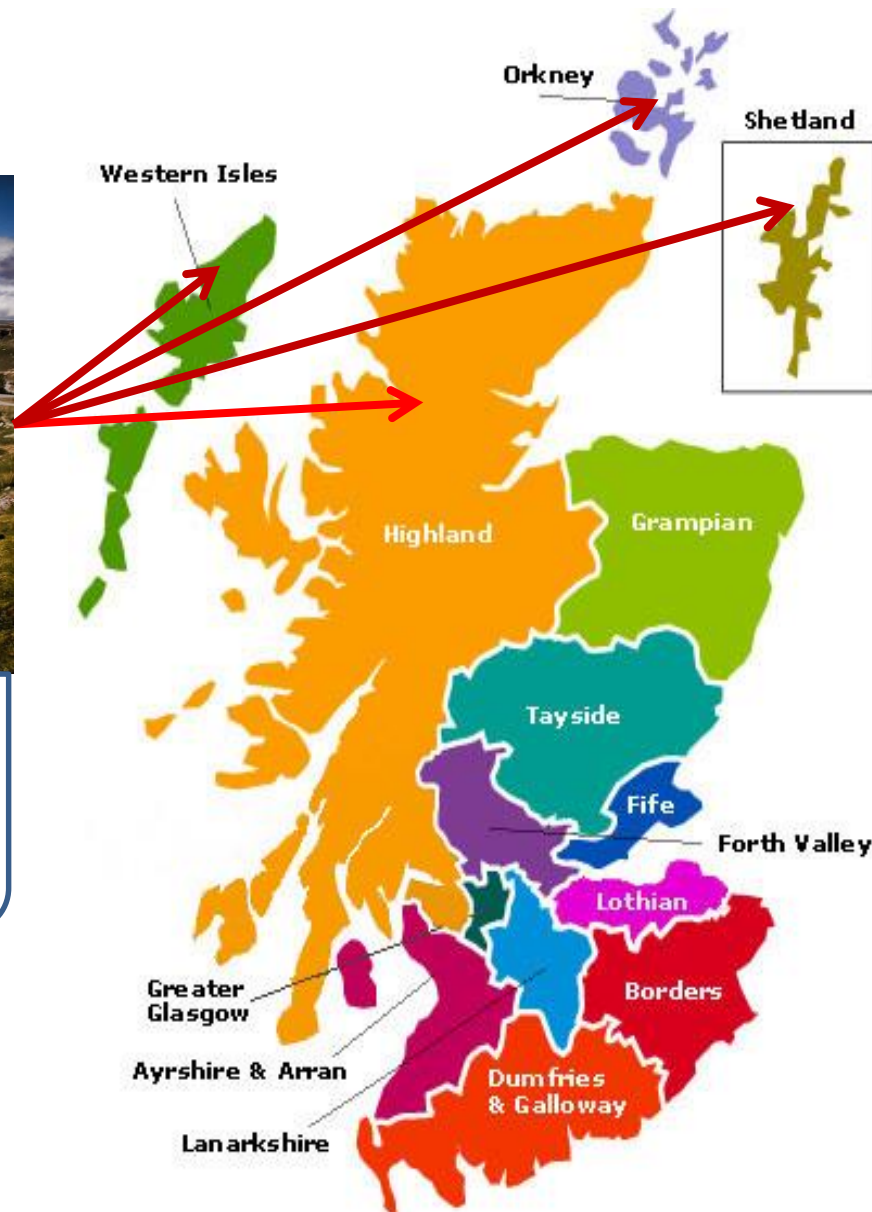
Aging population
Chronic disease
Mental health

- Recruitment and retention of health and care workers
- Sustainability and cost effectiveness of services

Social Prescribing

Connecting people to non-medical sources, community resources:

- Self-Management

- Person-centred, tailored

- Ownership

Sign-posting:

– Social/cultural/environmental resources

– **Reduce inequalities**

Community Resilience

- Empowering individuals
  - Collective action to increase own and others resilience
  - Come together to identify and support vulnerable individuals
  - Responsibility for promotion of resilience
- Benefits
  - Increase inclusivity and cohesion
  - Reduced health impacts

Smart sensors

FIT HOMES
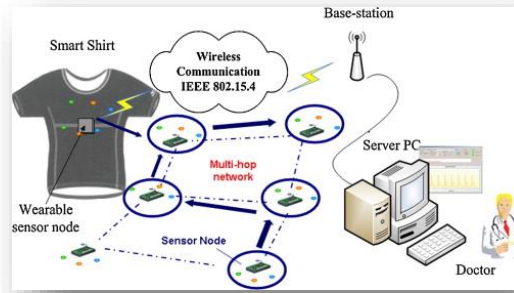
WEARABLES

Digital Health

Explore emerging digital technologies to improve physical & mental health outcomes

Social Prescribing

Behaviour change

Digital Narrative Approach: DNA

Film, TV, Computer games - narrative strategies engaging participants in health behaviour change and therapeutic interventions

Behaviour Change

NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE
Guideline scope (due 2020)
Behaviour change: technology-based interventions

.... **include interventions to change multiple behaviours.......**

......**the interventions will also focus on strategies to improve mental wellbeing (for example, building resilience....... reducing social isolation).........**

Joining the dots
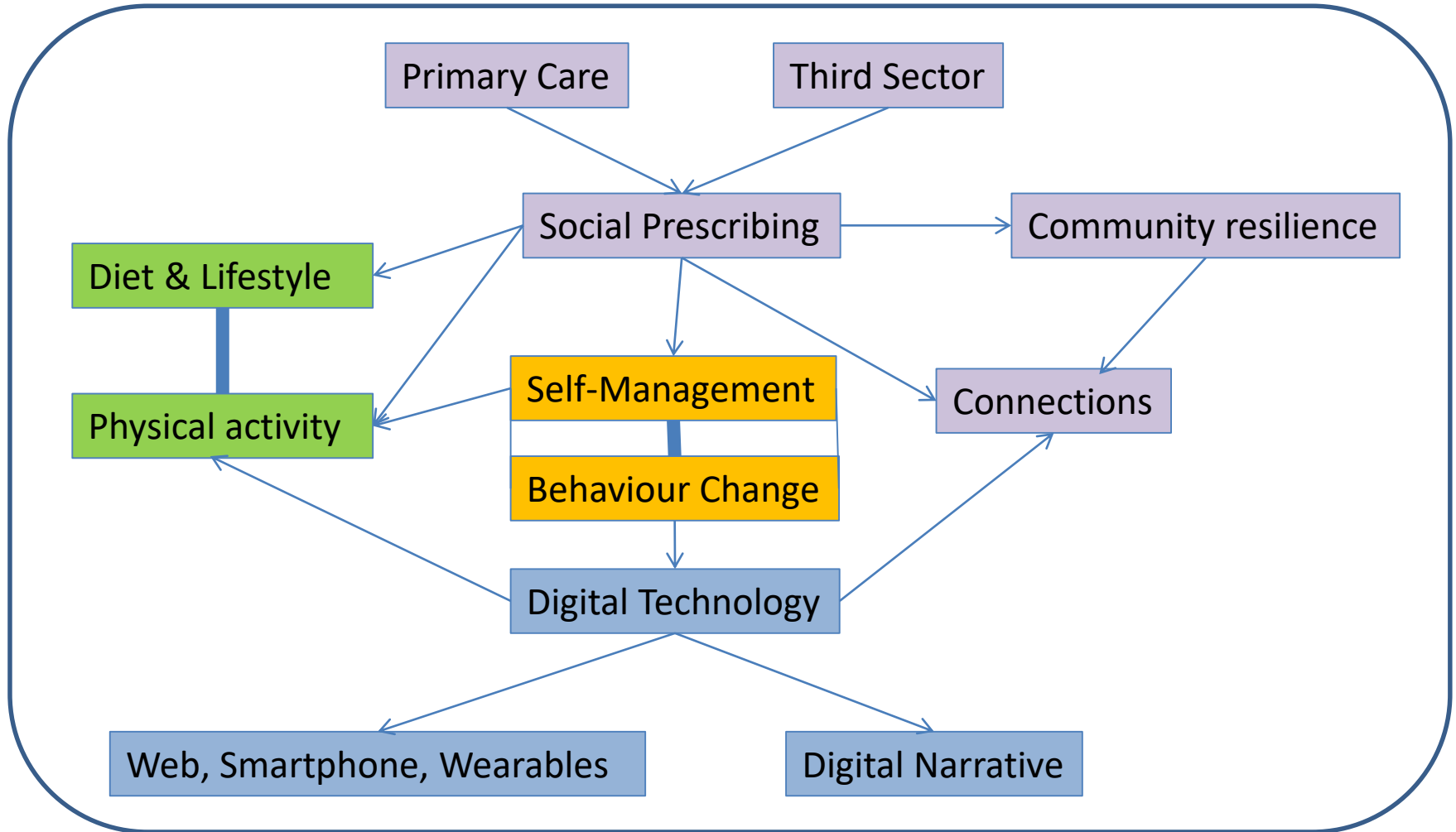
Connectivity
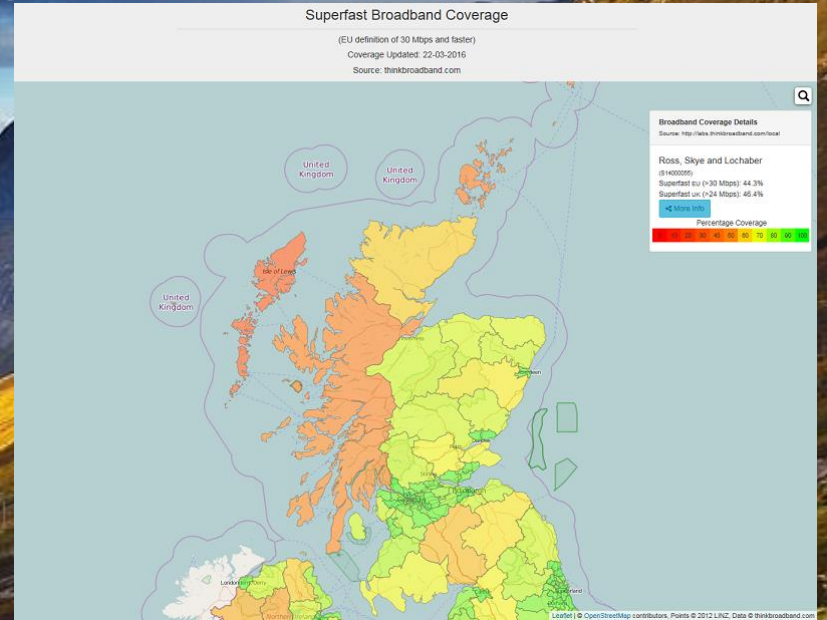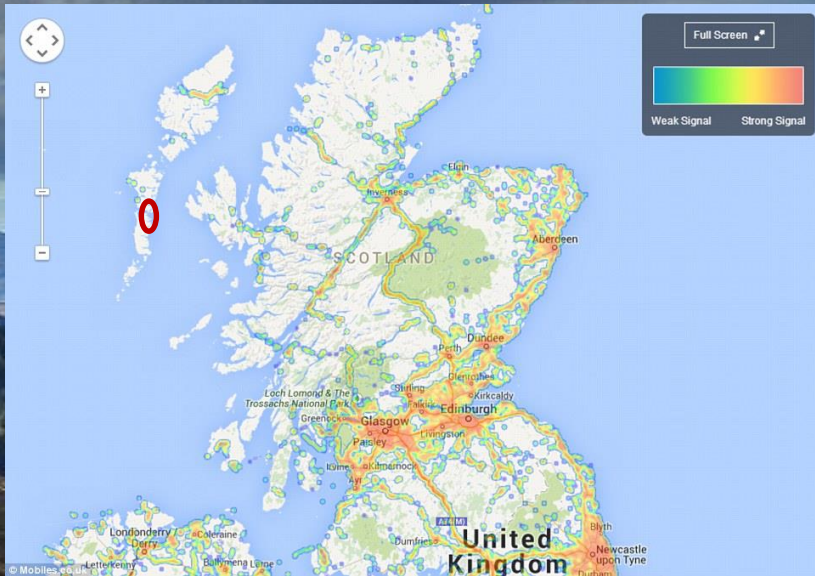
UHI Innovation centre
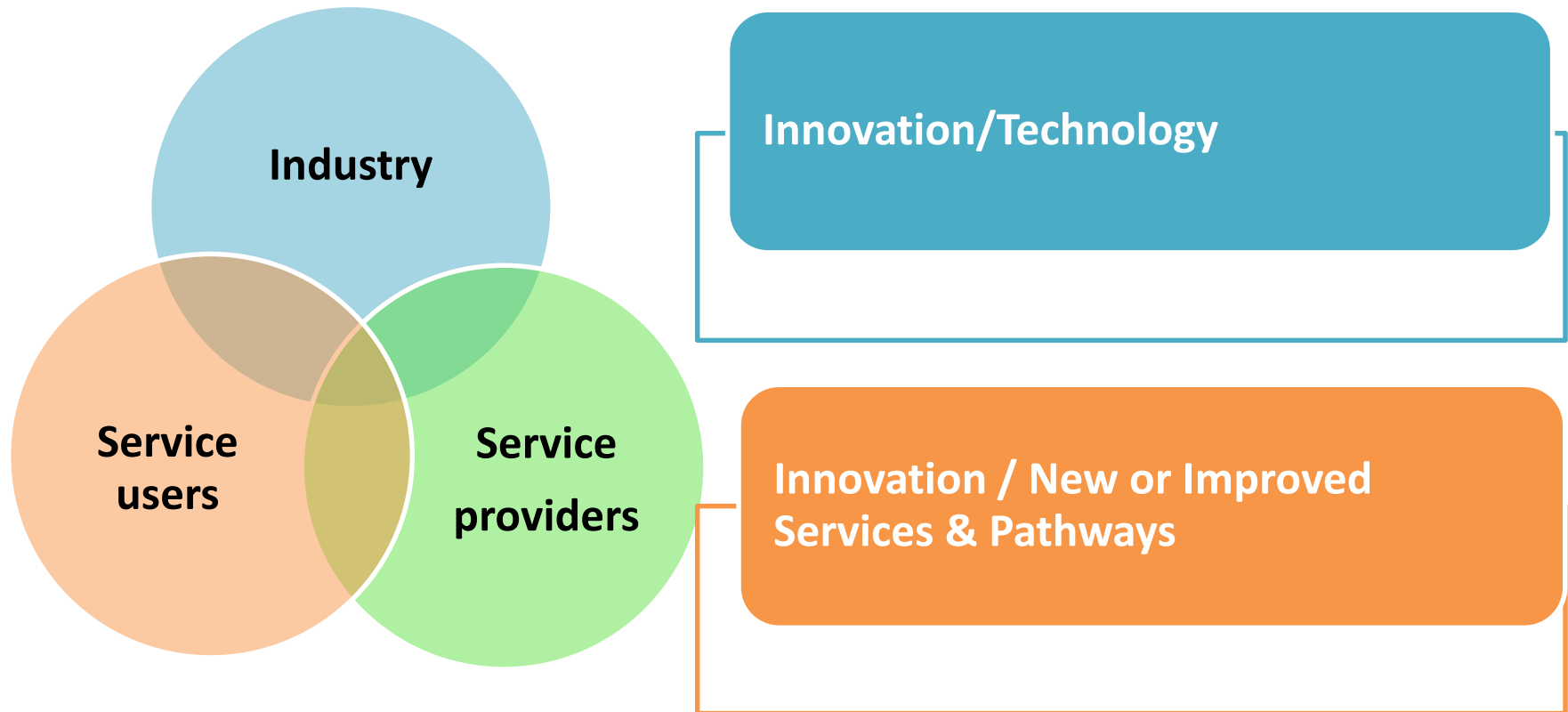
Innovation centre outcomes

25	20	15	10
Exportable healthcare improvements supporting remote and rural community	New digital health and applied life science products	Supported companies for product innovation in the region and UK	New start companies from spin outs or inward investment

Active Health Research Facility

- Cardiac rehabilitation
- Respiratory rehabilitation
- Musculoskeletal
- Cancer patients
- Pre-habilitation

- Improve quality of life
- Reduce readmissions
- Increase life expectancy
- Improve service delivery

Service delivery

Hub & spoke model

Active Health Centre

Patient-Centred Programmes
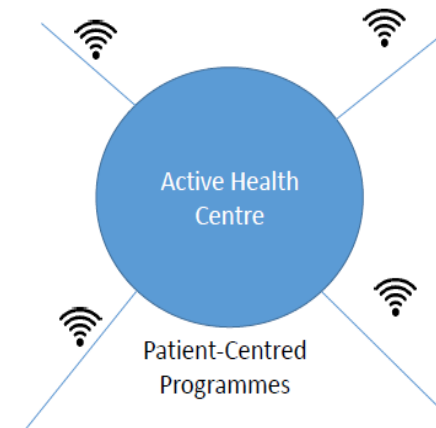
Teleconsultation
Telemonitoring
Telerehabilitation

University of the Highlands and Islands
Oilthigh na Gàidhealtachd agus nan Eilean

NHS Highland

Island Deal

Social Prescribing

Physical Activity

Mental Wellbeing

Healthy Aging
Whole population model

Northern Isles
Economic Development and Health of the Population
Western Isles

Remote & Rural Service Delivery
Enhanced health & social care

Prevention, Digital Health, Connectivity
Health Economics, Community Engagement

- New and improved service pathways
- Improved individual health and well-being
- Increased community well-being and resilience
- New and increased entrepreneurial activity related to health and wellbeing

University of the Highlands and Islands
Oilthigh na Gàidhealtachd agus nan Eilean

HEALTHY AGEING INNOVATION CLUSTER

Moira Mackenzie
Director of Innovation, DHI

Healthy Ageing Innovation Cluster

Purpose

- Collective of shared interest - expertise and skills
- Share information and support knowledge exchange
- Seek & solve demand led challenges
- Host challenge competitions
- Identify funding opportunities

Activities

- Current focus on anticipated IUK Grand Challenges – Healthy Ageing but many other funding sources
- Identify key priorities and collaboration opportunities

Facilitated by…..

DIGITAL
HEALTH & CARE
INSTITUTE

Enabling independent living

Next Generation Service
for Healthy Ageing

Connecting People, Improving Lives:
A Digital Future for Technology Enabled Care (TEC)?

1.7 million Vulnerable people rely on telecare in the UK

Common devices include **pendant alarms** and **fall detectors**

Technology Enabled Care (TEC) helps people live independently at home, avoiding **homecare, care homes** and **hospital**

Most telecare connects via **telephone lines** to one of the UK's **240+** monitoring centres

BUT by **2025** all UK analogue telephone services in the UK will be **SWITCHED OFF** and **REPLACED BY DIGITAL CONNECTIONS**

ON
OFF
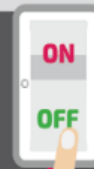
If telecare providers don't **upgrade** from analogue to digital **BY 2025** then many people could lose the technology that keeps them safe

Any loss of TEC would put pressure on health and social care

SLOW

Yet action is slow and **uncertain**

TSA 2017

1st

Innovate UK | ISCF - Wave 2 (£729.5m) | 19

INDUSTRIAL STRATEGY

Ageing Society

We will harness the power of innovation to help meet the needs of an ageing society.

Healthy ageing (up to £98m)

What is Healthy Ageing?

- WHO Definition of Healthy Ageing – the process of developing and maintaining functional ability that enables wellbeing in older age

IUK NEWS (Nov 2018)

IUK Challenge Vision: People will enjoy 5 more years of healthy independent life by 2035, with the gap between the experience of the richest and the poorest narrowing

THEMES?

- Sustaining physical activity
- Maintaining health at work
- Designing for age-friendly homes
- Managing common complaints of ageing

- Living well with cognitive impairment
- Supporting social connections
- Creating healthy and active places

Positive Disruption of existing Models of Care

http://dhi-scotland.com/healthy-ageing-innovation-cluster/

NGS Final Animation - Aug 2018

People can take their blood pressure and upload readings whilst out and about.

00:01:05

00:01:21

Next Generation Service for Health Ageing

Our aim is to extend healthy independence through developing a new digitally enabled and integrated service model to address key issues such as:

- Frailty
- Long term conditions
- Co-morbidities
- Loneliness

We will do this by delivering:

1. A Blue print for a proactive, personalised, predictive Healthy Ageing service model

2. The foundation for advanced healthy ageing analytics

3. Accelerated market access for third party technology & service innovations

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New service model which brings the whole network together

User

Informal carer/ Family
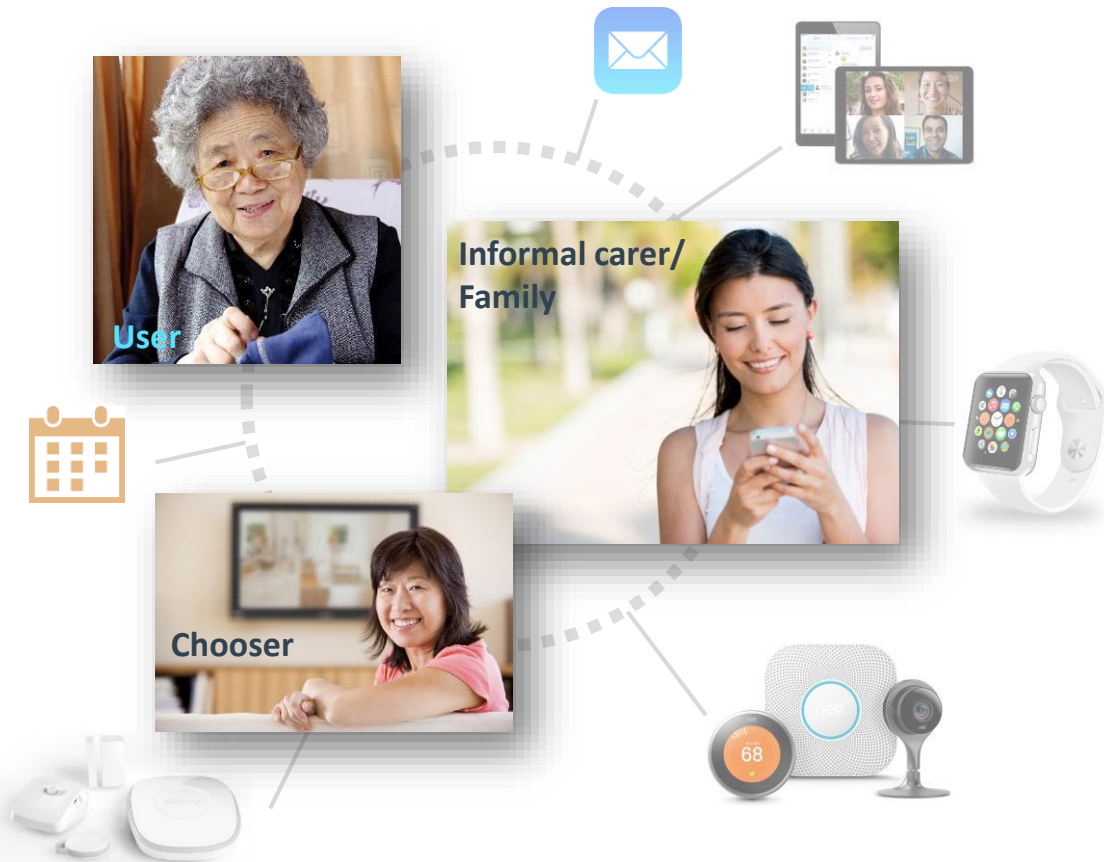
Chooser

The connectivity of IP has the power to deliver a wide range of possibilities within Independent living – for users, choosers and formal and informal carers.

There is growing consumer interest in health and well being applications and services.

Business models are changing with data as the crucial element rather than hardware of software products.

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Personalised, connected healthy ageing services

Services in the home:
- Extension of environmental and personal sensors use for domestic and personal adverse events (gas leaks, water, fire, falls, movement, medication, epilepsy crisis, enuresis, etc.)
- Continuous remote monitoring to define activity patterns and increase predictive capabilities

Health Programmes:
- Appointment Scheduling & Reminders
- Integration between platform and EHR
- Definition of processes and protocols for integrated health and care pathways, transitional services and referral processes
- Remote tele/video consultations
- Physical and functional tele-rehabilitation
- Telemonitoring for people with chronic diseases.
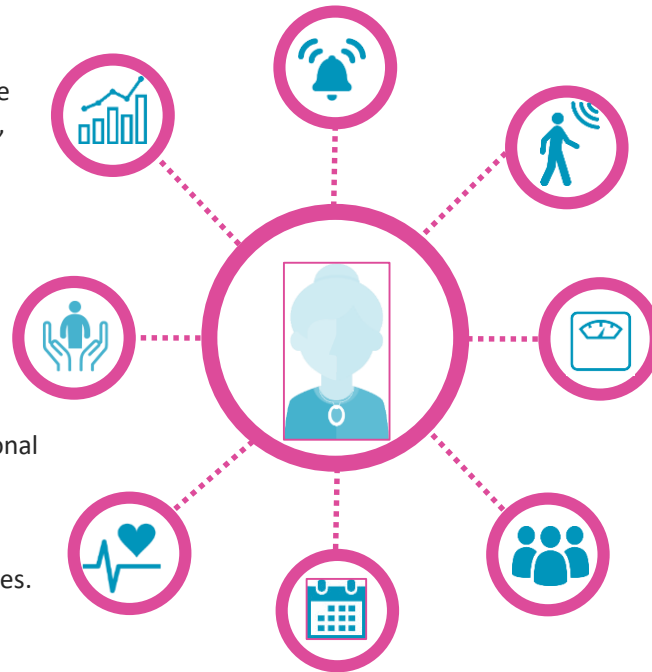
Services outside the home:
- Mobile technologies with geolocation
- Monitoring on the move
- Digital Inclusion/skills programme

Care Programmes;
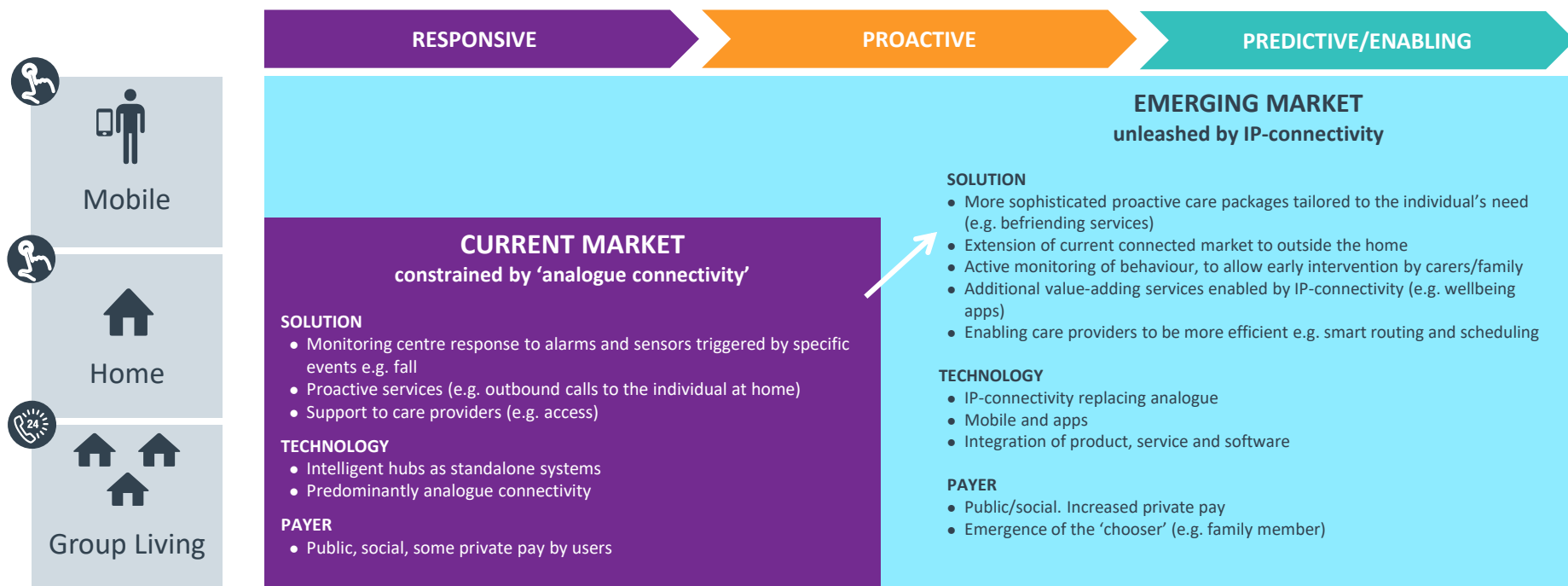- Early detection and prevention of cognitive impairment.
- Carers support programmes
- Tele-visits
- Special protocols:
  - End of life care.
  - Abuse prevention.
  - Suicide prevention.
  - Contingency and major disaster management

Social connections;
- Active and Healthy Ageing Promotion
- Cognitive Tele-stimulation/Games
- Social networking/video calls

DIGITAL HEALTH & CARE INSTITUTE

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IP connectivity is transforming market from responsive to predictive

Mobile

Home

Group Living

RESPONSIVE	PROACTIVE	PREDICTIVE/ENABLING

EMERGING MARKET
unleashed by IP-connectivity

CURRENT MARKET
constrained by 'analogue connectivity'

SOLUTION
- Monitoring centre response to alarms and sensors triggered by specific events e.g. fall
- Proactive services (e.g. outbound calls to the individual at home)
- Support to care providers (e.g. access)

TECHNOLOGY
- Intelligent hubs as standalone systems
- Predominantly analogue connectivity

PAYER
- Public, social, some private pay by users

SOLUTION
- More sophisticated proactive care packages tailored to the individual's need (e.g. befriending services)
- Extension of current connected market to outside the home
- Active monitoring of behaviour, to allow early intervention by carers/family
- Additional value-adding services enabled by IP-connectivity (e.g. wellbeing apps)
- Enabling care providers to be more efficient e.g. smart routing and scheduling

TECHNOLOGY
- IP-connectivity replacing analogue
- Mobile and apps
- Integration of product, service and software

PAYER
- Public/social. Increased private pay
- Emergence of the 'chooser' (e.g. family member)

Developments in technology, such as mobile capability and increased connectivity are stimulating the transition towards more proactive and predictive/enabling care, by increasing the value of these new models of care to key stakeholders

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Service Users and their carer network engaging with Care data
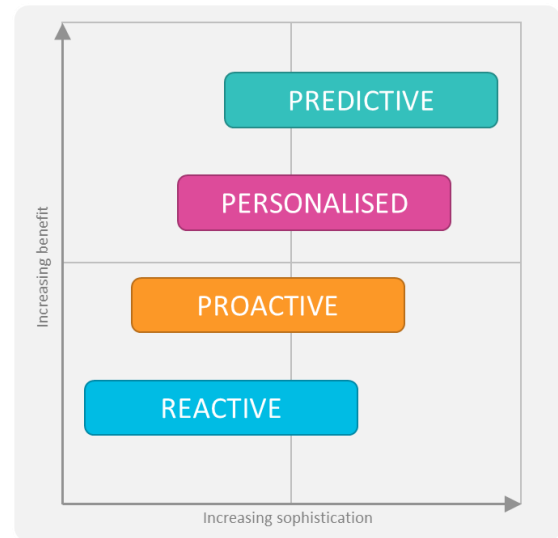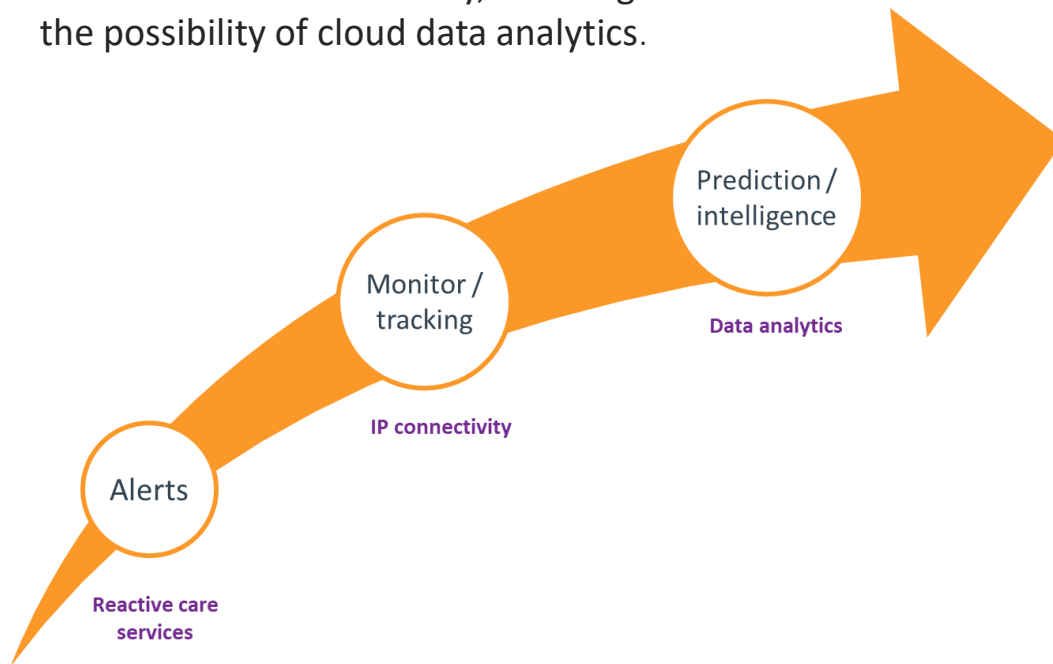
Enabling self-management

- Easy to use and intuitive **Service User App**

- **Automated Alerts** and ability for **Manual Entry** of BYOD expanding variety of devices utilised

- **Care & Health Questionnaires** for non-device related care and wellbeing information

- Bi-directional **Messaging** for interactive service users and support network communication

- **Video Conferencing** improving service user / patient interaction

- Citizen view of **Monitoring Results**

- **Bluetooth low-energy** service user extending life between charges and improving usability
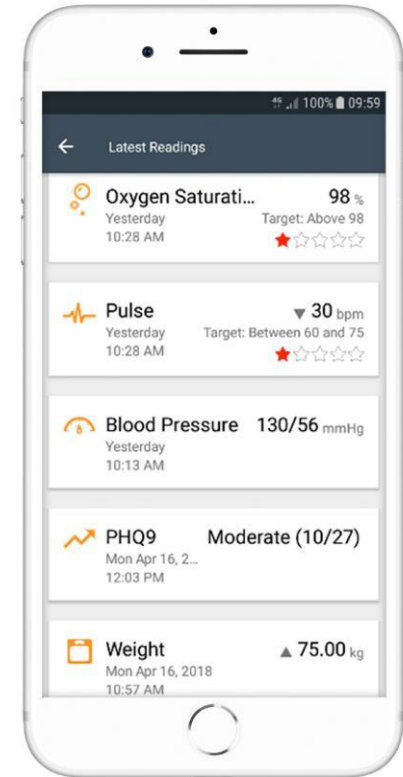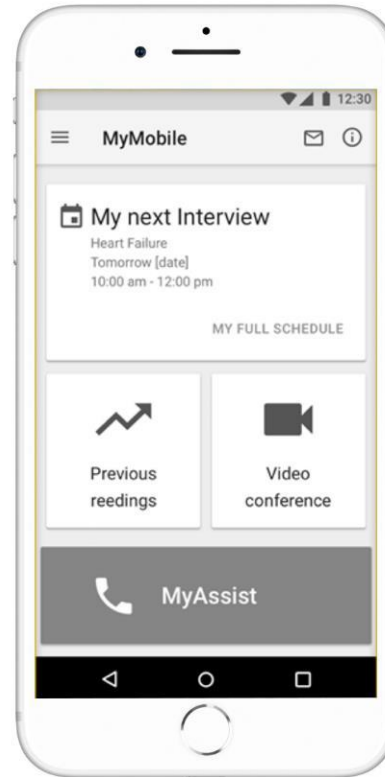
Where is the journey taking us?

IP unlocks great potential to combine mass data and connectivity, enabling the possibility of cloud data analytics.

Alerts

Reactive care services

Monitor / tracking

IP connectivity

Prediction / intelligence

Data analytics

Increasing benefit

PREDICTIVE

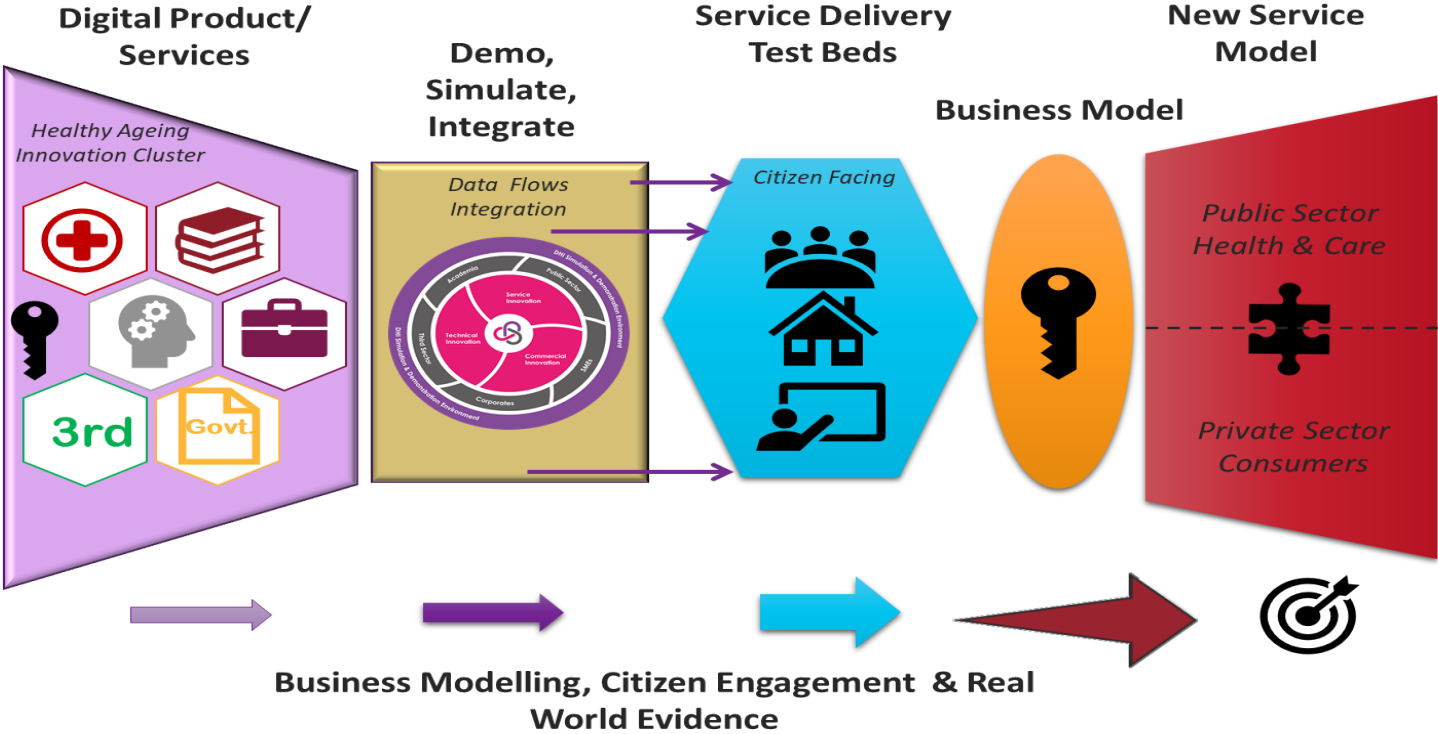PERSONALISED

PROACTIVE

REACTIVE

Increasing sophistication

Predict events before they happen, highlight increased risk of falls or issues around the home

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Advanced Analytics Platform for Healthy Ageing Service
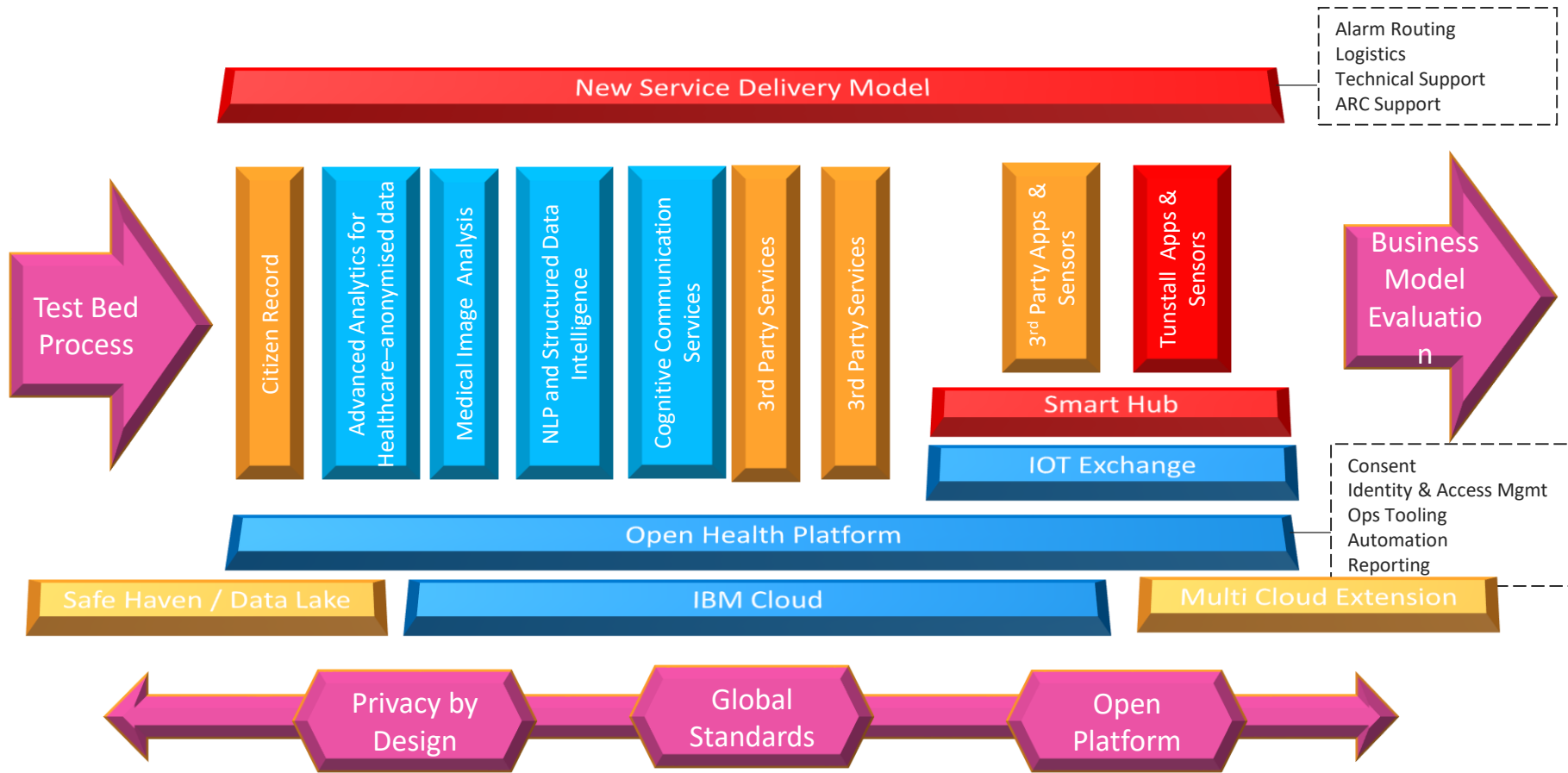
Integrated and accelerated marketplace

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Thank you

moira.mackenzie@dhi-scotland.com

Twitter: @mackmoira

Tunstall

Taking the first steps towards healthy ageing – the user's perspective

John MacDonald - SCVO

A project supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB)

What is mPower?
Healthy & Connected Communities

- EU funded 5 year project; 2017 to end of 2021

- Northern Ireland, Republic of Ireland and Scotland

- Supporting older people (65+) living with long-term conditions

- Reducing un-necessary presentation to primary care

- Enabling people to live well, safely and independently in their own homes

- Supporting self-management of their care in their community

- Reducing isolation and the impact of loneliness

Rationale for mPower

- Demographics

- Increasing demands on GPs

- Loneliness and Isolation

- Historical silo based models

- Health and digital literacy

- Chronic Illness

60% deaths due to LTC

By age 65, 66% people will have 1 or more LTC

80% GP consultations relate to LTC, with 30% not medically required

RCGP: 900 GPs short by 2020

A project supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB)

Did you KNOW

70-80%

People **can** self- manage if provided with the **right** information and support

Kings Fund- 10 priorities for Commissioners (2015)

What are mPower's key targets?
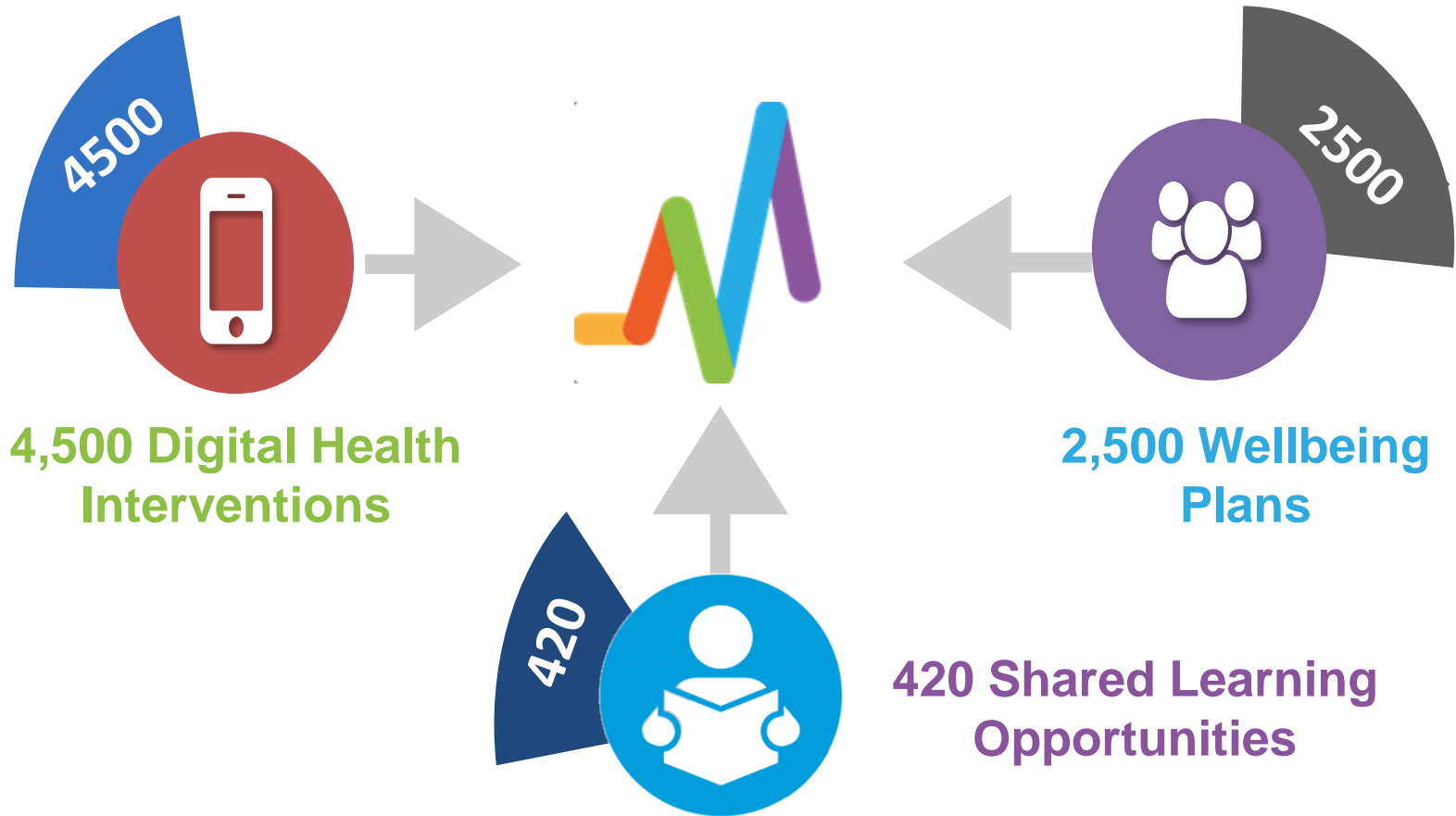
4500 — **4,500 Digital Health Interventions**

2500 — **2,500 Wellbeing Plans**

420 — **420 Shared Learning Opportunities**

How will mPower's objectives be achieved?

- Establish cross sectoral collaboration across Republic of Ireland, Northern Ireland and Scotland to support greater mobility, confidence and reach of health & care professionals and services;

- Effectively engage individuals, community organisations and services in redesign of health and care services.

- Employing Community Navigators to work with people to develop wellbeing plans that connect to community activities

- Employing Implementation Leads to connect services to new technology that support health and wellbeing

How will mPower's objectives be achieved?

- Establish cross sectoral collaboration across Republic of Ireland, Northern Ireland and Scotland to support greater mobility, confidence and reach of health & care professionals and services;

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Social Prescribing

- Non medical interventions aimed at connecting people with their communities

- Recognises that people's health and wellbeing is determined by a range of social, economic and environmental factors

- Seeks to address people's needs in a whole person or 'holistic' way

- Can involve a variety of activities which are typically provided by voluntary and community sector organisations.

- Aims to connect people to others and reduce the isolation that can manifest in loneliness which exacerbates LTC management

What does Social Prescribing look like?

Music, Dance & Arts activities

Befriending

Group learning; Walking groups; Games / Sports

'Men's Sheds'

Social Groups: Knit and Natter; Book clubs; Cookery

Volunteering; Time banking

Benefits of Social Prescribing

- More independence
- Less intensive supports
- Better self management
- Less Hospital usage
- Less isolation

British Journal of Community Nursing May 2016 Vol 21, No 5

What is eHealth (Digital Health)?

For mPower eHealth (often now called Digital Health) can be broken down into three areas of focus:

Home & Mobile Health Monitoring (HMHM)
- Monitoring devices (remote and self managed)
- Text updates, support & encouragement e.g. Florence

Video Enabled Care (VEC)
- Health professional direct to patient's home, one-to-one
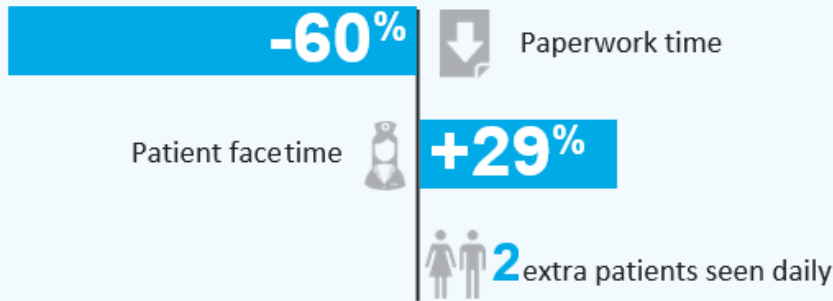- Specialist to patient in remote practice with additional health professional support in room

Digital Health Applications (Apps)
- Health professional recommended apps
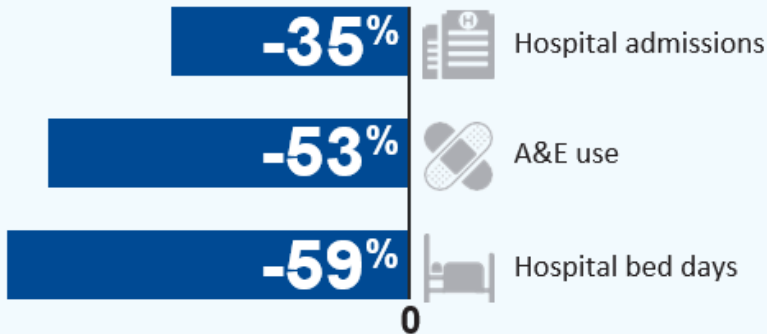- Self selected apps supporting self-management

Why use digital health?

Evidence of health technology benefit for providers

A mobile working solution for community nurses

-60% Paperwork time

Patient face time +29%

2 extra patients seen daily

A telehealth hub across 210 care homes

-35% Hospital admissions

-53% A&E use

-59% Hospital bed days

0

Evidence of health technology benefit for patients

75% of the UK population goes online for health information

Patients using technology to manage their COPD:

97% High satisfaction

62% Increased confidence

94% Better treatment compliance

Deloitte 2015 – Connected Health

mPower approach to mobile and digital apps