

Unlocking the Power of Linked Road Safety and Health Data

Seema Yalamanchili

General Surgeon & Clinical Research Fellow



IMPERIAL

Scale of Road Injuries in Great Britain



Every

17 minutes*

someone is killed or seriously injured on UK roads

*over a 10-year average from 2014 to 2023

“every 19 days the equivalent of a whole class of young children is killed or seriously injured on roads in Britain.”

Brake

“RTCs kill an average of 5 people every day and seriously injure a further 82”

With more road deaths each year than homicides and terrorist attacks combined we need a greater emphasis on road safety

The Police Foundation

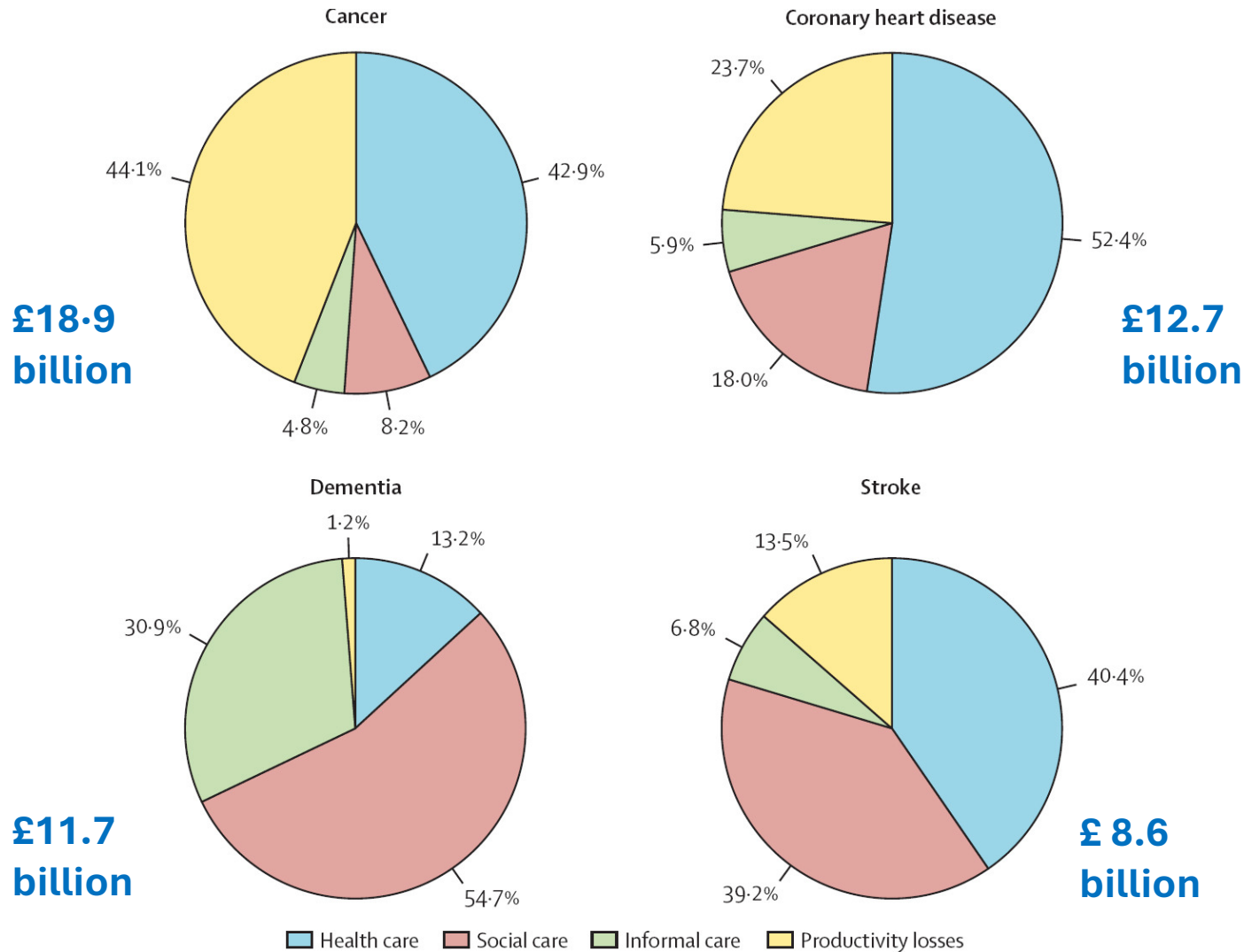
Approx 1,700 road fatalities and 30,000 killed or seriously injured annually (DfT)

The Hidden Burden of RTI

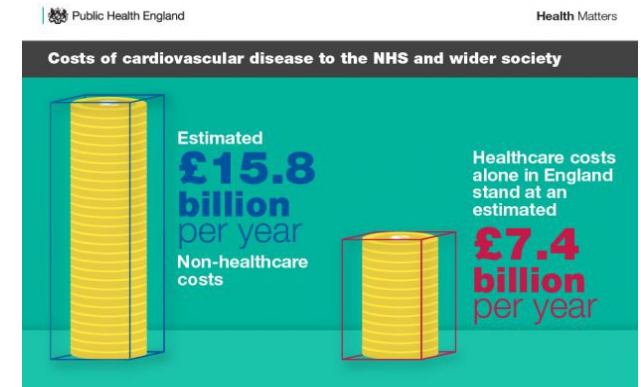
- Hidden cause of mortality in the health statistics
 - Higher proportional rates by age group
 - Often grouped with other accidents or injuries
 - Siloed statistics in transport and health sectors
- Non-fatal injuries are likely underestimated in severity and number
 - For every death, there are at least a further 15 seriously injured
- Psychological component
 - considered 'accidents' and to some extent inevitable or acceptable



...but the costs are substantial



Distribution of total costs for cancer, coronary heart disease, dementia, and stroke in England in 2018
Landeiro et al, Lancet, 2024



Cardiovascular disease, (Eng)=£23.2B
Kings Fund & PHE, 2019



*In 2018, DfT estimated the total cost for all reported and unreported road traffic collisions was around **£36 billion** per year.*

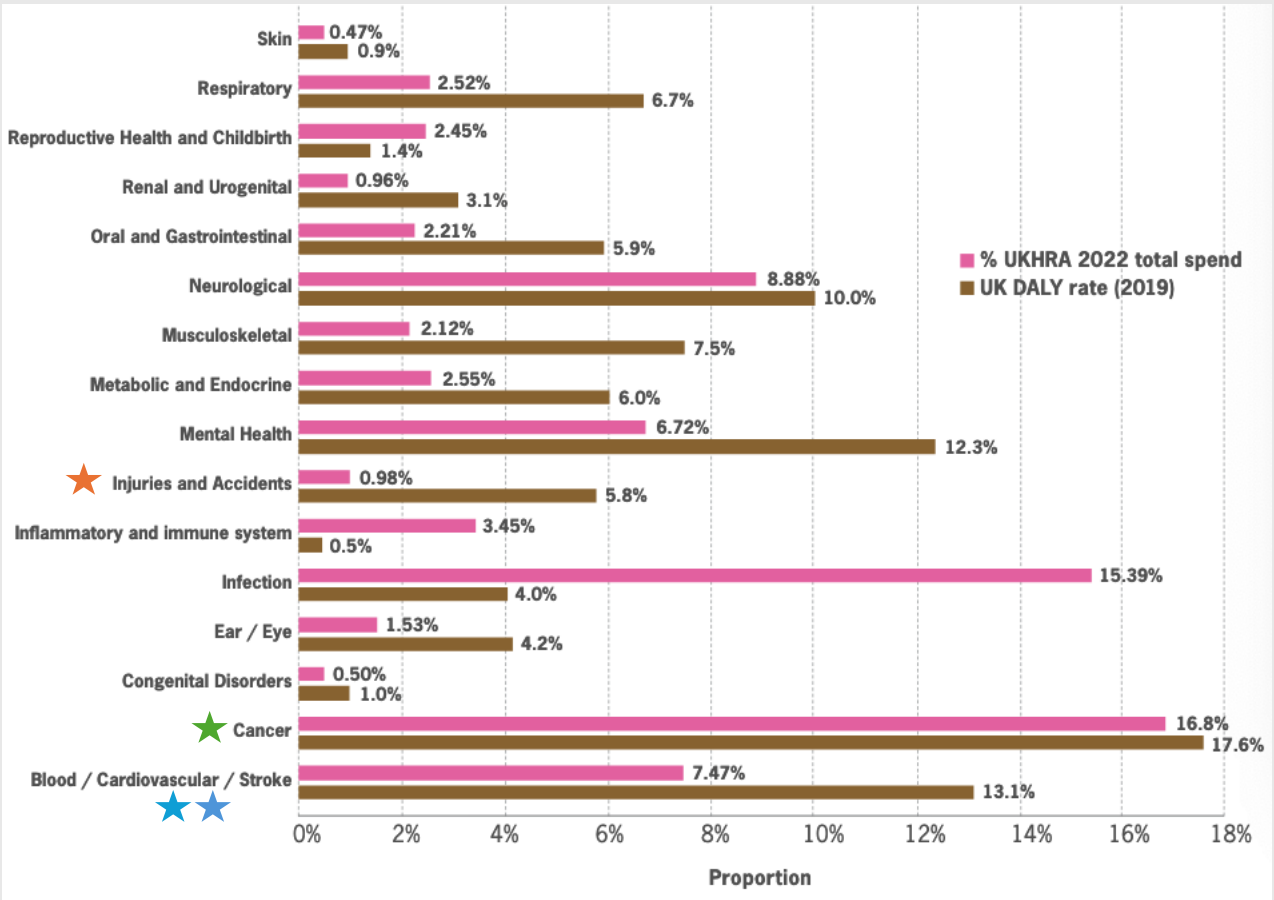
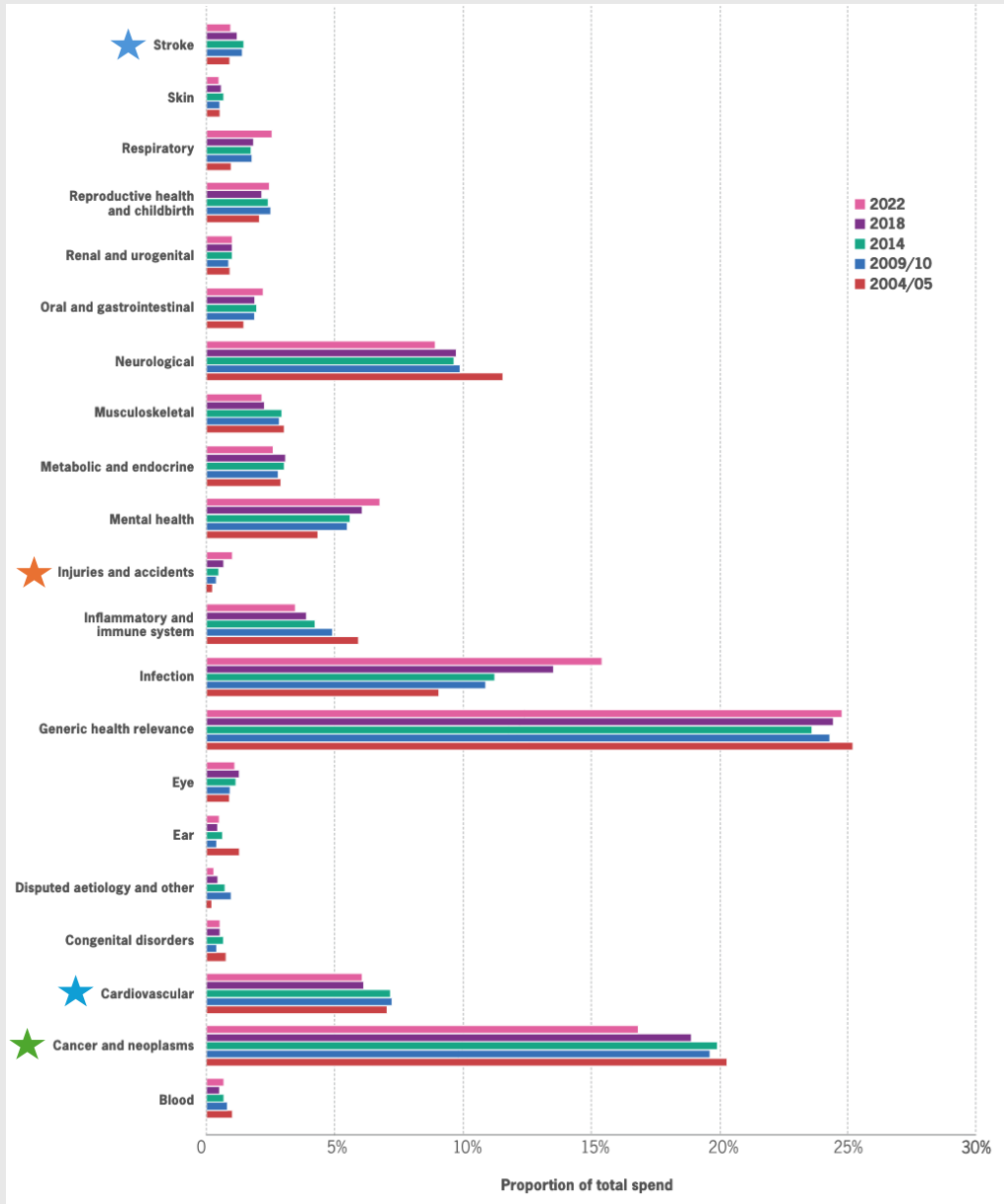
The cost of Road collisions & injuries (UK)

	Unit Cost (GBP)	Total cost (GBP)
Fatalities	2.52 million	4.0 billion
Seriously injured	0.29 million	6.8 billion
Slight injuries	0.03 million	2.4 billion
Property damage costs of non-injury crashes	0.002 million	4.4 billion
Non-fatal crashes not reported to the police		25.6 billion
Total	..	43.2 billion
Total as % of GDP	..	1.4 %

International Transport Forum & OECD, 2022

Cost distribution: healthcare, loss of productivity, infrastructure, property

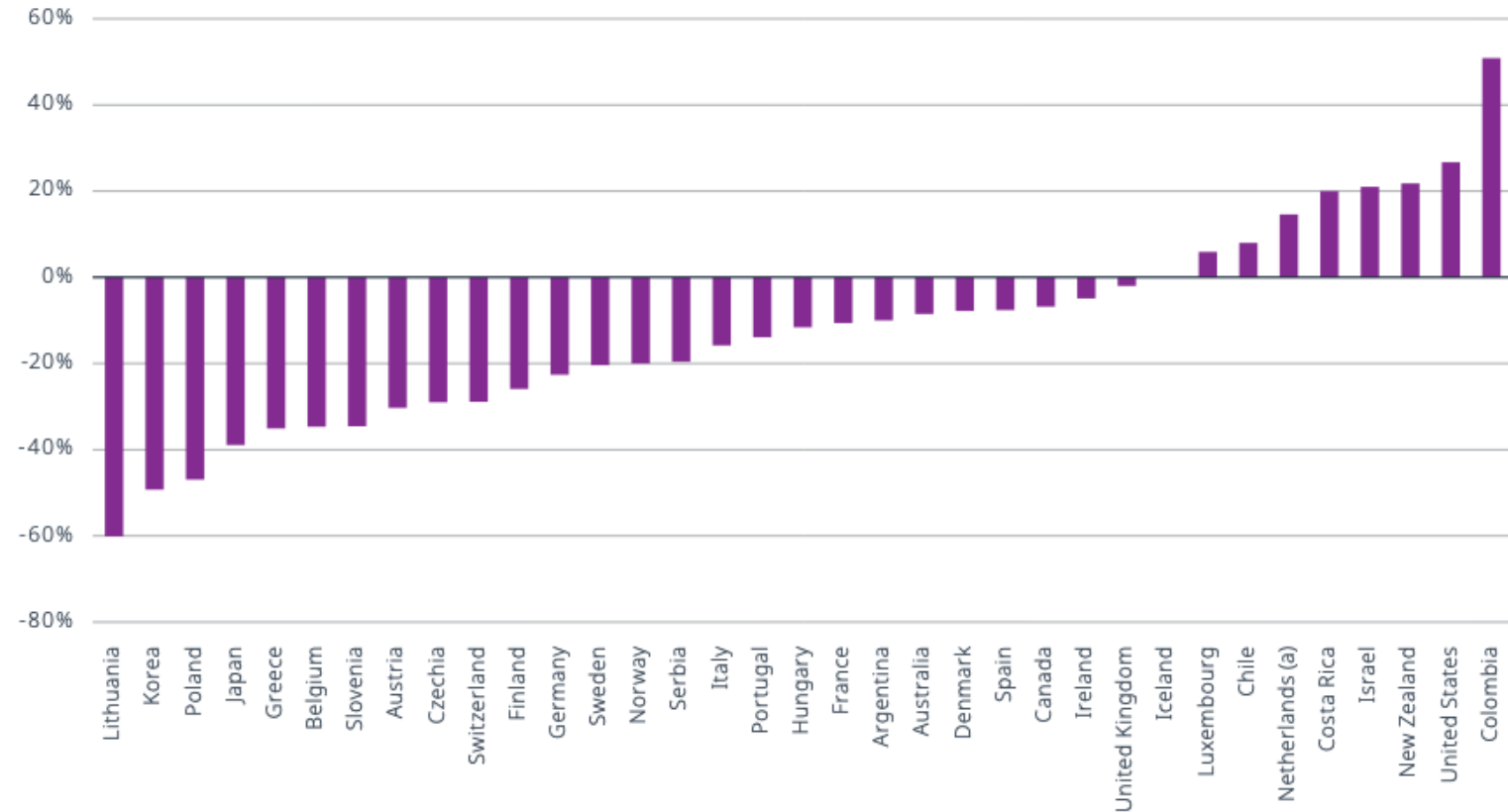
Relative health research funding



UK Health Research Analysis 2022
(UK Clinical Research Collaboration , 2023)

International Comparisons

Percentage change in the number of road deaths, 2012-22



International Transport Forum, 2023

TARGETS

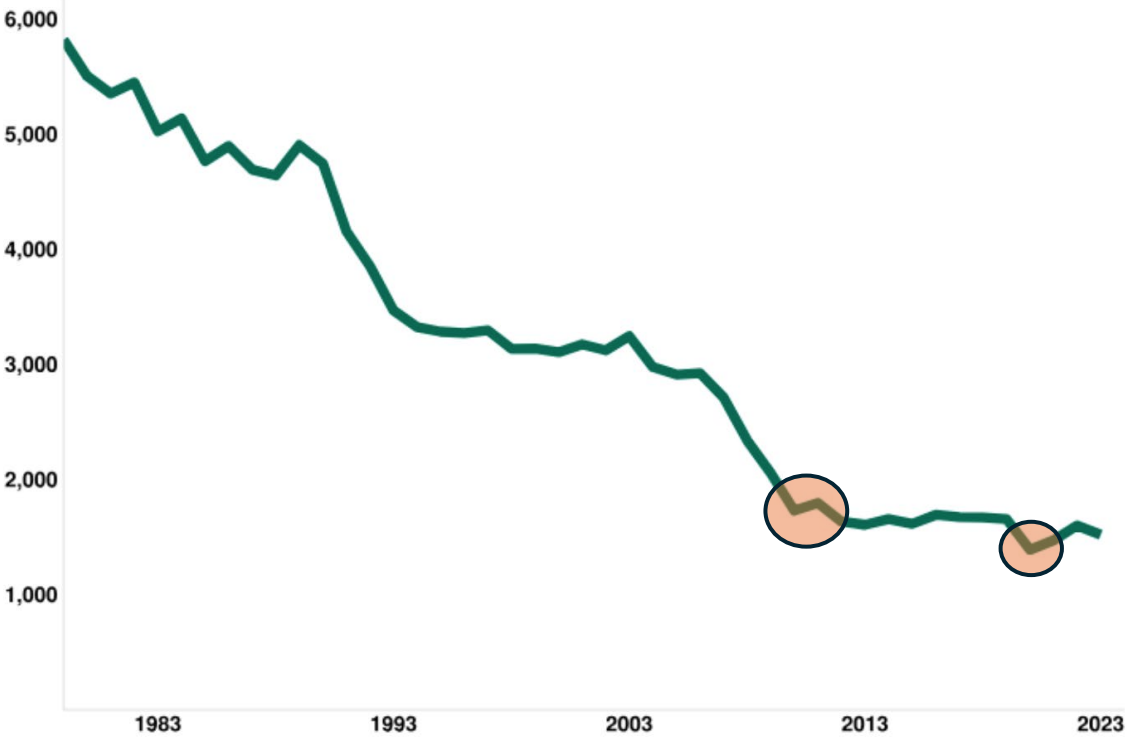
UN SDG 3.6:

Reduce RTI by 50% by 2030

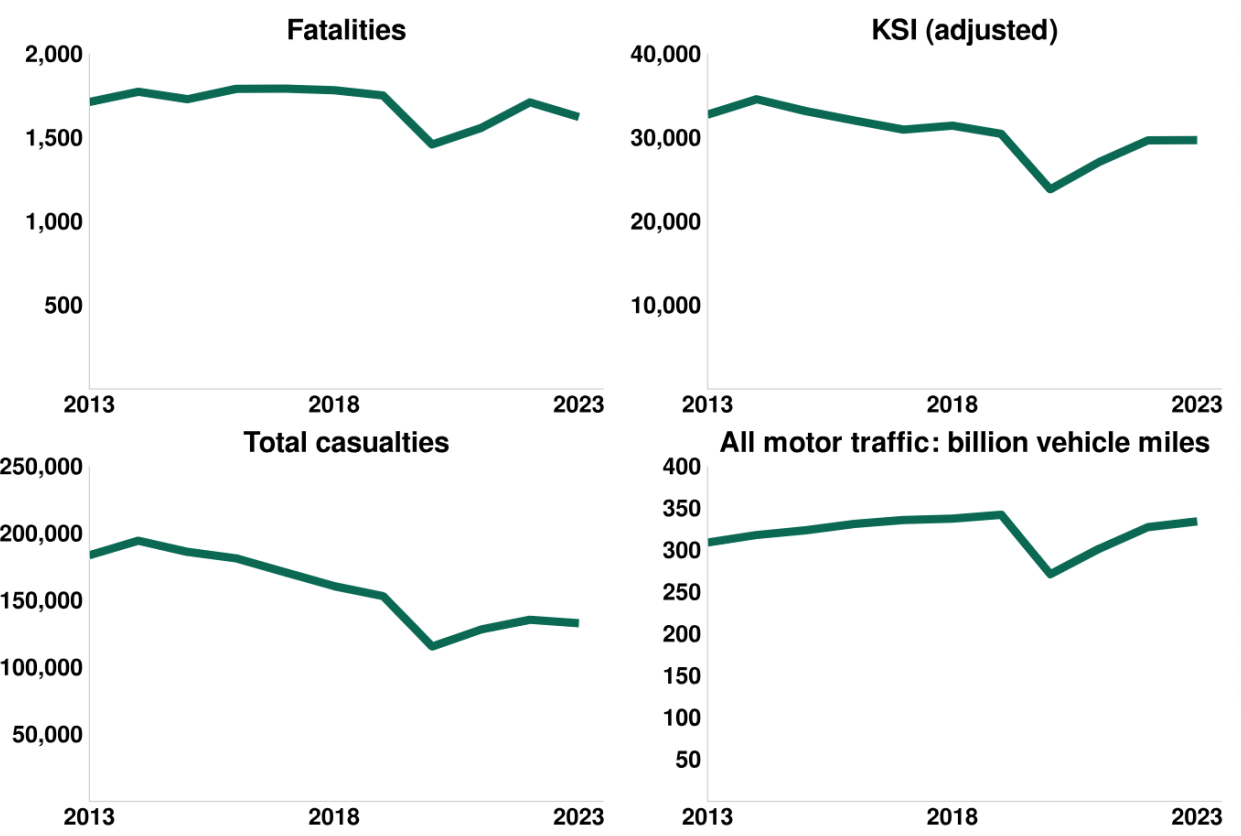
Vision Zero:

Eliminate all fatalities and serious injuries by 2040

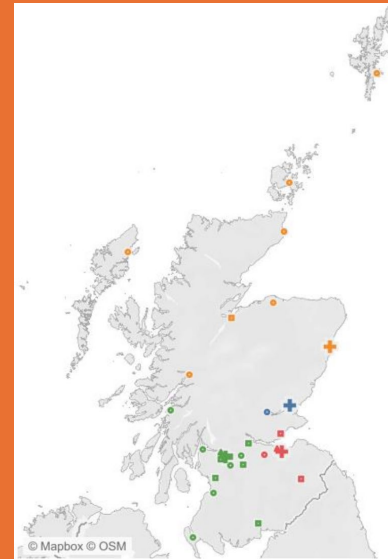
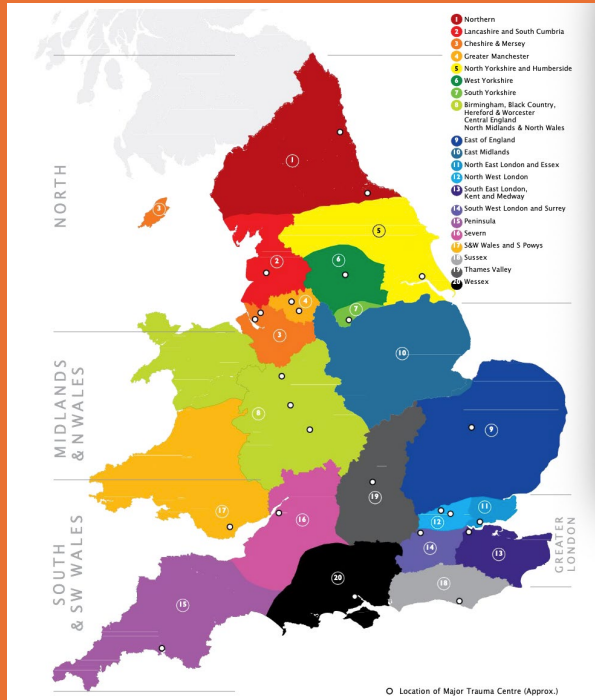
The plateau in progress on RTI



Reported road fatalities in Great Britain, 1979 to 2023



Reported Road Casualties for Great Britain, 2023 (DfT)



The UK Major Trauma Network – a parallel story

- 50% reduction in mortality in the first 5 years in London (Cole et al, 2015)
- 20% reduction in mortality in the first 5 years nationally (Moran et al, 2018)

STATS19

Limitations

- By definition, does not include all collisions
- Fatalities almost always captured
- Severity is likely underestimated* (definitions also vary)
- Not all non-fatal injuries are recorded*
- Vulnerable groups including cyclists and pedestrians under-reported*
- The role of post-crash care is unclear*

**discerned from previous linkage studies with hospital data*

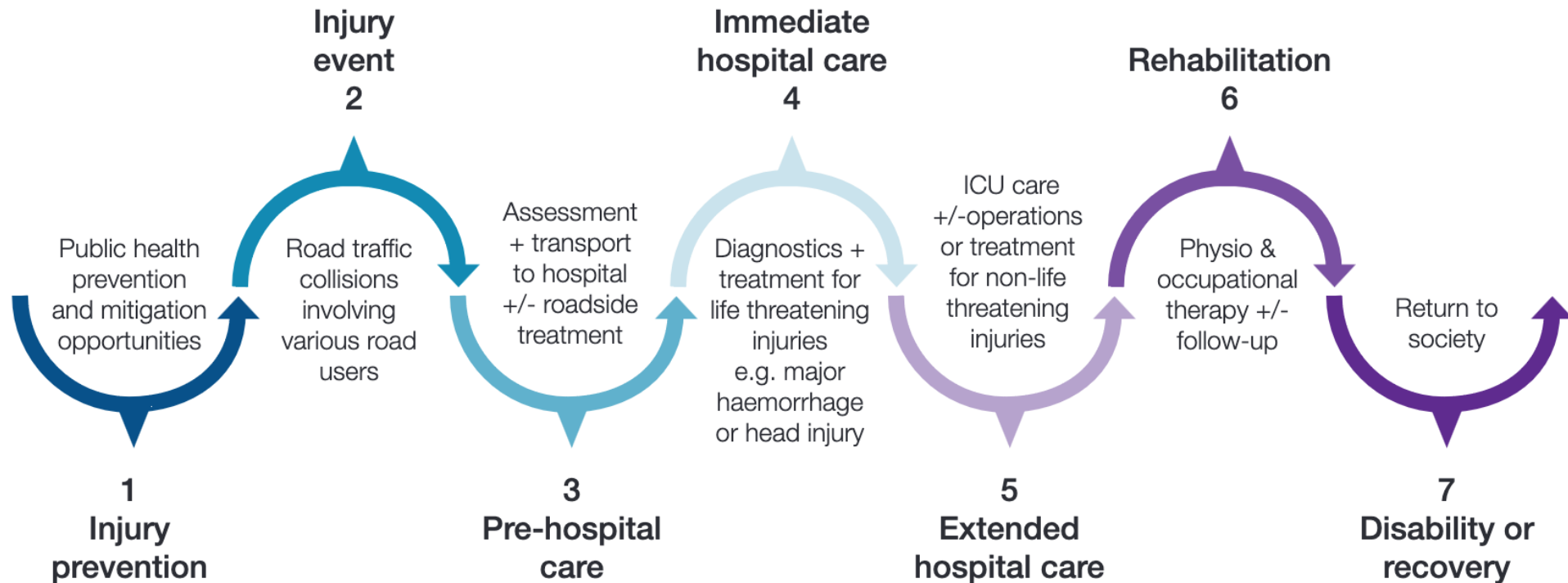
Severity Code	Severity		injury code	Most Severe Injury	CRASH Police Forces only
1	Killed		1		1 Deceased
2	Serious		2		5 Broken neck or back
3	Slight		3		5 Severe head injury, unconscious
			4		5 Severe chest injury, any difficulty breathing
			5		5 Internal injuries
			6		5 Multiple severe injuries, unconscious
			7		6 Loss of arm or leg (or part)
			8		6 Fractured pelvis or upper leg
			9		6 Other chest injury (not bruising)
			10		6 Deep penetrating wound
			11		6 Multiple severe injuries, conscious
			12		7 Fractured lower leg / ankle / foot
			13		7 Fractured arm / collarbone / hand
			14		7 Deep cuts / lacerations
			15		7 Other head injury
			16		3 Whiplash or neck pain
			17		3 Shallow cuts / lacerations / abrasions
			18		3 Sprains and strains
			19		3 Bruising
			20		3 Shock
			21		Any* Other injury

Why severity matters

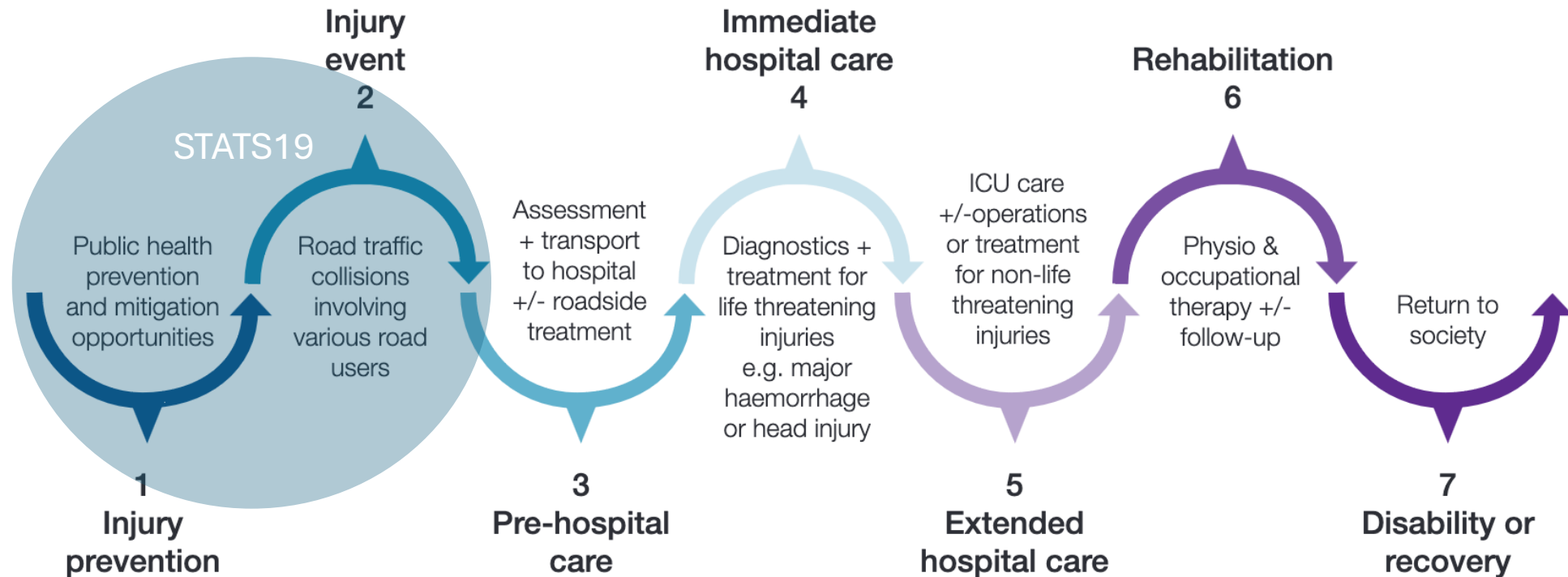
- Most injuries are non-fatal
- Accurate severity outcomes are required for economic and human cost analysis
- Shared language between health and transport (IBRS vs MAIS3+ vs ISS>8 or 15 vs ICD)
- Accurate injury severity threshold setting and reporting
- A small number of severe injuries and a large number of less severe injuries both have a significant impact on society and therefore relevance to policy design

AIS code	Injury Level	Fatality Range
0	No injury	0.0 %
1	Minor	0.0 - 0.1 %
2	Moderate	0.1 - 0.4 %
3	Serious	0.8 - 2.1 %
4	Severe	7.9 - 10.6 %
5	Critical	53.1 - 58.4 %
6	Maximum	Virtually unsurvivable

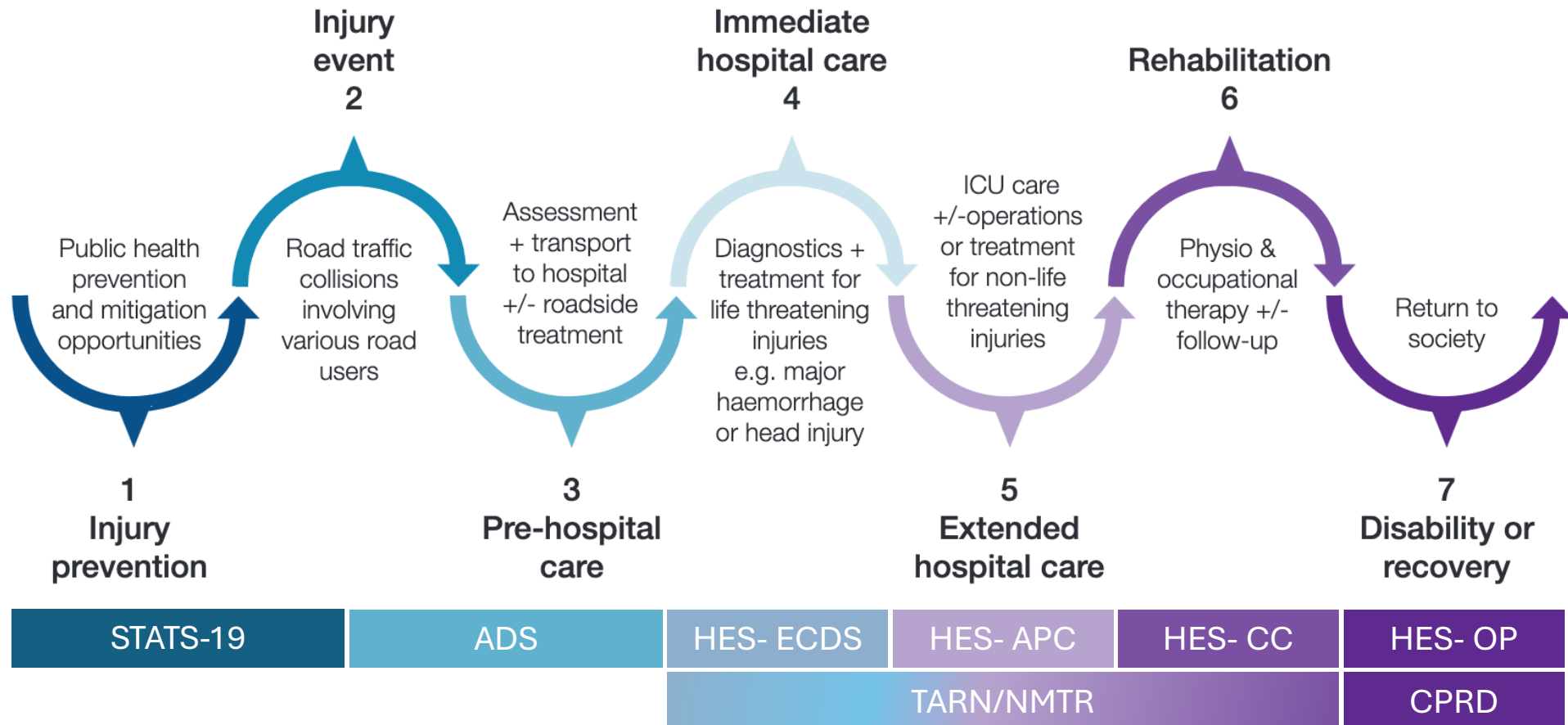
Describing the RTC-RTI continuum



Describing the RTC-RTI continuum

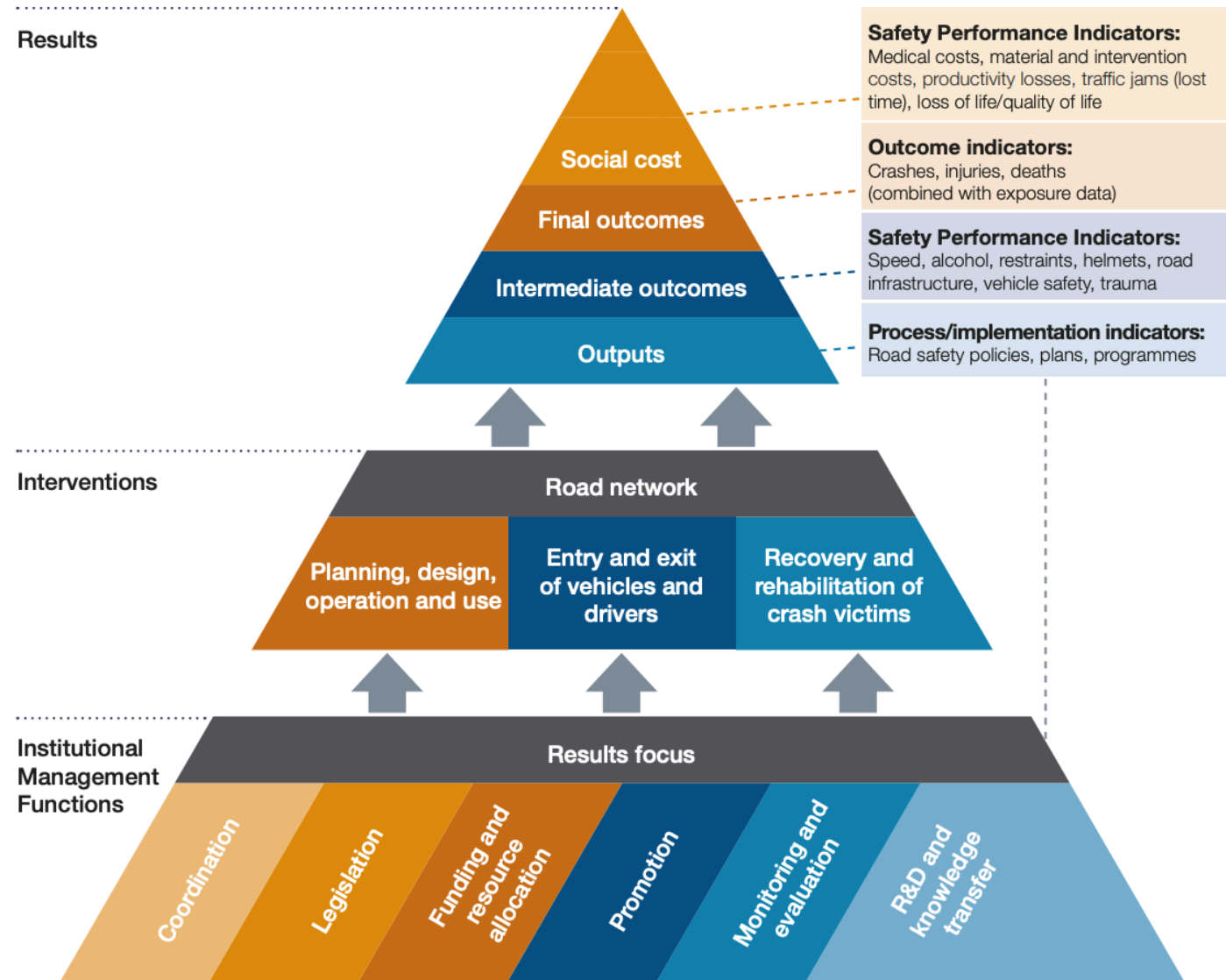


Describing the RTC-RTI continuum



Good data underpins effective road safety strategy

Sweden (STRADA), New Zealand (SORTED) and other countries are now using national linked police-hospital data for road casualty stats



The Drive for (better) Data Linkage



Systemic Review Programme

Joining Up Data for Better Statistics



Department
of Health &
Social Care

Policy paper

Data saves lives: reshaping health and social care with data

Updated 15 June 2022

The header of the ADRUK website, featuring the ADRUK logo (a stylized 'A' with a circle) and the Economic and Social Research Council logo. Below the logos is a navigation menu with links: 'Our mission', 'Our work', 'Data access', 'About us', 'News & publications', 'Learning Hub', and a search icon. The main headline reads 'Administrative data for public good.' followed by a sub-headline: 'As a major investment by the Economic and Social Research Council, Administrative Data Research UK (ADRUK) is a UK-wide programme that brings together the wealth of public sector data into research insights.'

HDRUK
Health Data Research UK

About Advancing Health Research Account

Home | News

Opinion

Using linked data for research: challenges and opportunities within the UK health ecosystem

A review commissioned by the Secretary
of State for Health and Social Care

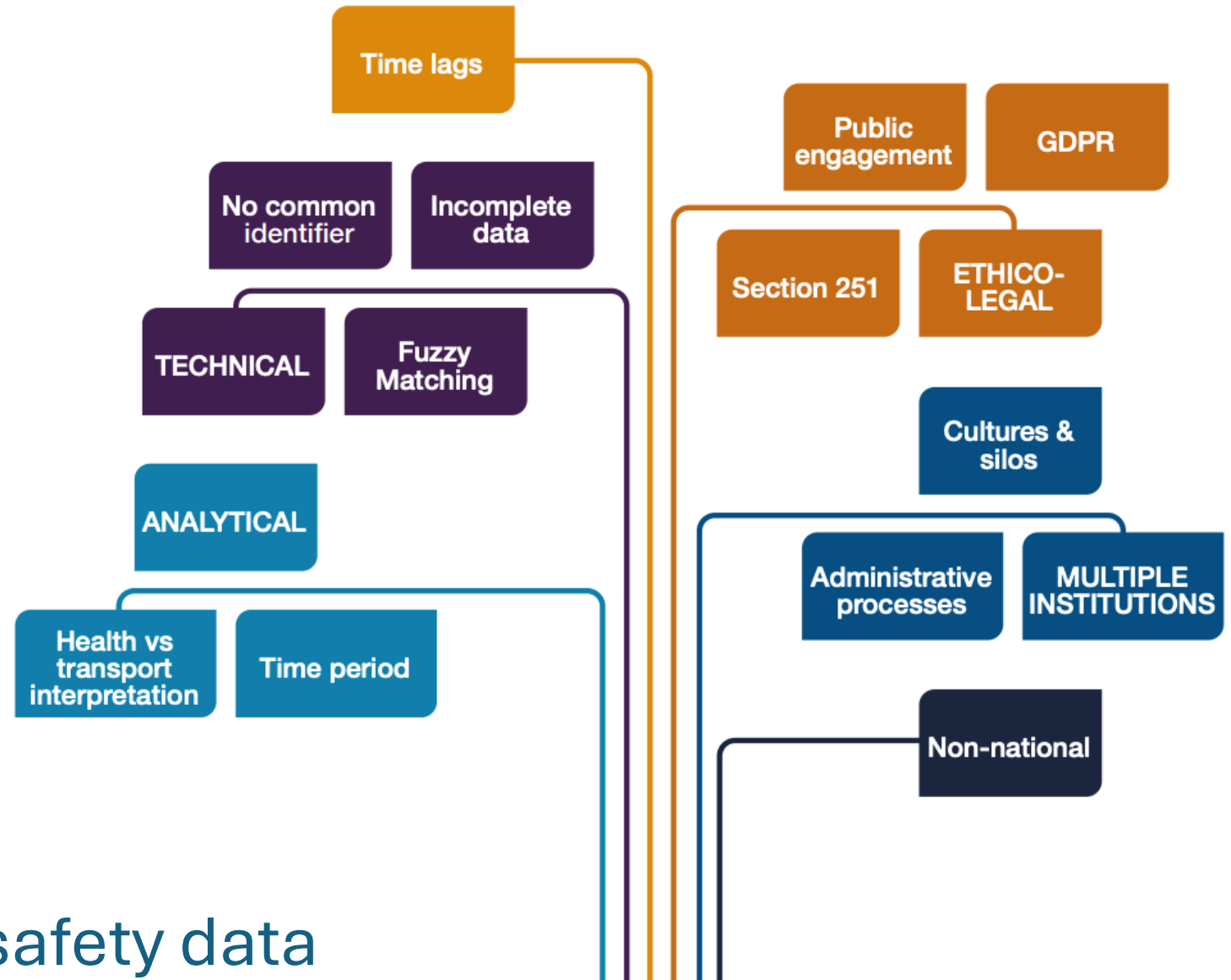
Better, Broader, Safer: Using Health Data for Research and Analysis

April 2022



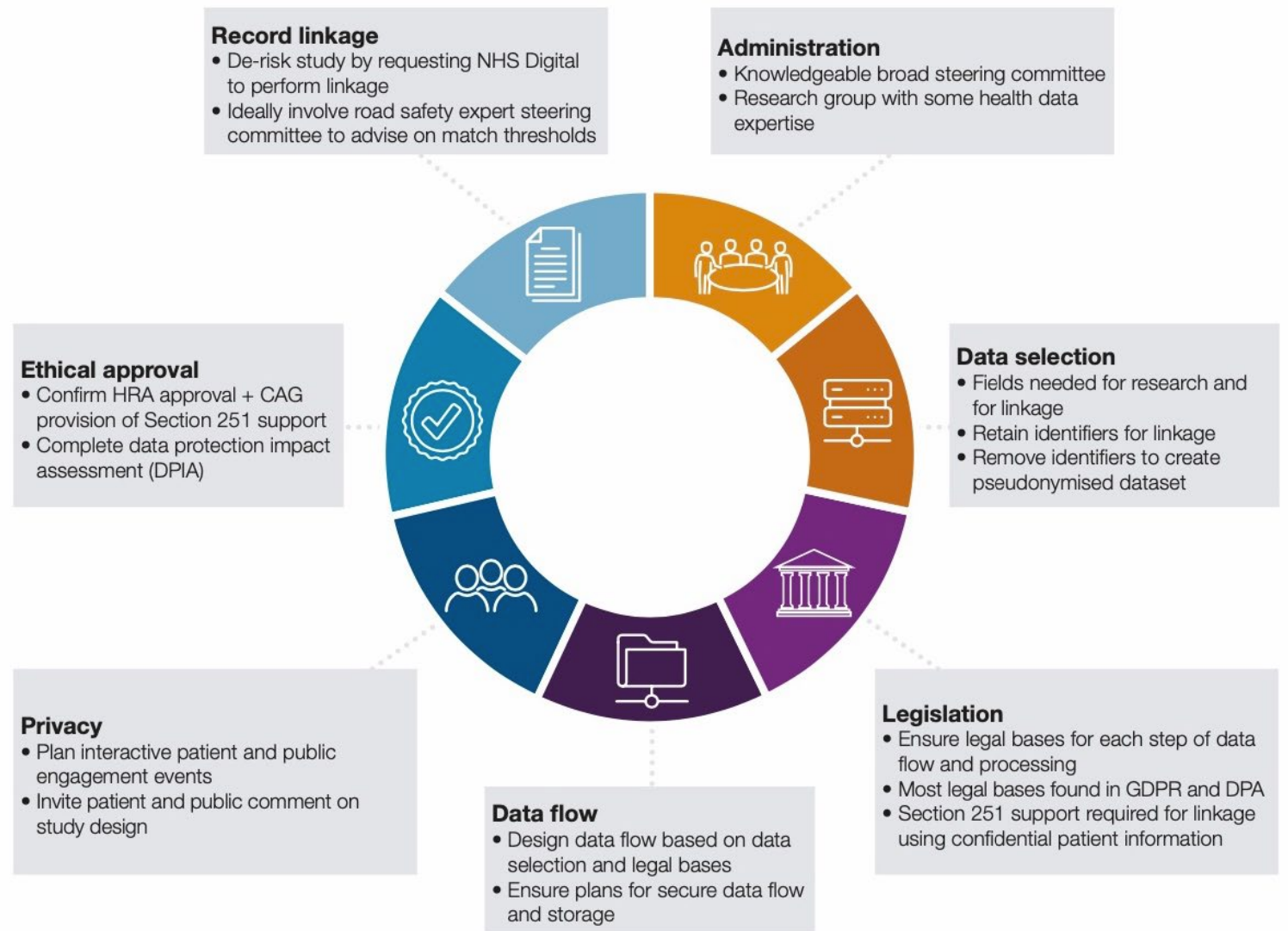
Barriers

to national linked road safety data



Process

for national linked road safety data



The advantages of a national linked road safety dataset

- **Completeness** – moderate and slight injuries captured, vulnerable road users better represented
- **Accuracy** – confirmed clinical outcome and intervention coding
- **Better national statistics** – reliable comparison across regions and time periods
- **Holistic analysis** – appreciating continuum of roadside factors and post-crash care
- **Targeted interventions** – both preventative (public health) and post-crash healthcare response
- **Democratised analysis** – a range of researchers can take on relevant analysis locally and nationally without having to replicate complex permissions
- **Contemporary methods** – including machine learning for matching, analysis and scoring/threshold setting
- **Cost-savings** – reduce duplicated efforts, leverage power of existing data, focus available funds on high impact targets

Linked road safety data to date (HRA-CAG approved)

DfT Previous periodic national STATS19-HES linkage (40% match rate),
Pilot regional linkage STATS19-TARN/NMTR (80% match rates with postcode)
No active linkages to health data at present

RTI-AID Imperial & RAC Foundation (FIA funded)
STATS-19, London Ambulance data, HES (ECDS, APC), TARN/NMTR
Scope: Greater London; Health data linkage component discontinued

(RAIDS) Transport Research Laboratory, established in 2012, ongoing
Use of crash investigation findings for severe collisions + hospital records
Current scope: Berkshire, Buckinghamshire, Hampshire and Oxfordshire
Has informed development of policy, technology and practice

PRANA NHS Secure Data Environment with wide stakeholder engagement
Proof of linkage STATS19-NMTR-Ambulance NHS trust data for Wessex
Planned linkage to HES ECDS, APC & CC, mortality data, coroners data, RAIDS (national)

Comprehensive Data

- describes the depth and breadth of RTCs & RTI accurately

Legal Compliance

- GDPR
- HRA & CAG approvals

Accessibility

- for wide range of appropriate stakeholders and researchers
- TRE/SDE
- collaboration

Expert Stewardship

- multidisciplinary
- oversight of matching
- strategy design

Public Confidence

- transparency
- PPIE work
- ongoing public engagement

Sustainability

- long term sectoral commitment (£ & administration)
- adaptable for the future (datasets and road behaviour)

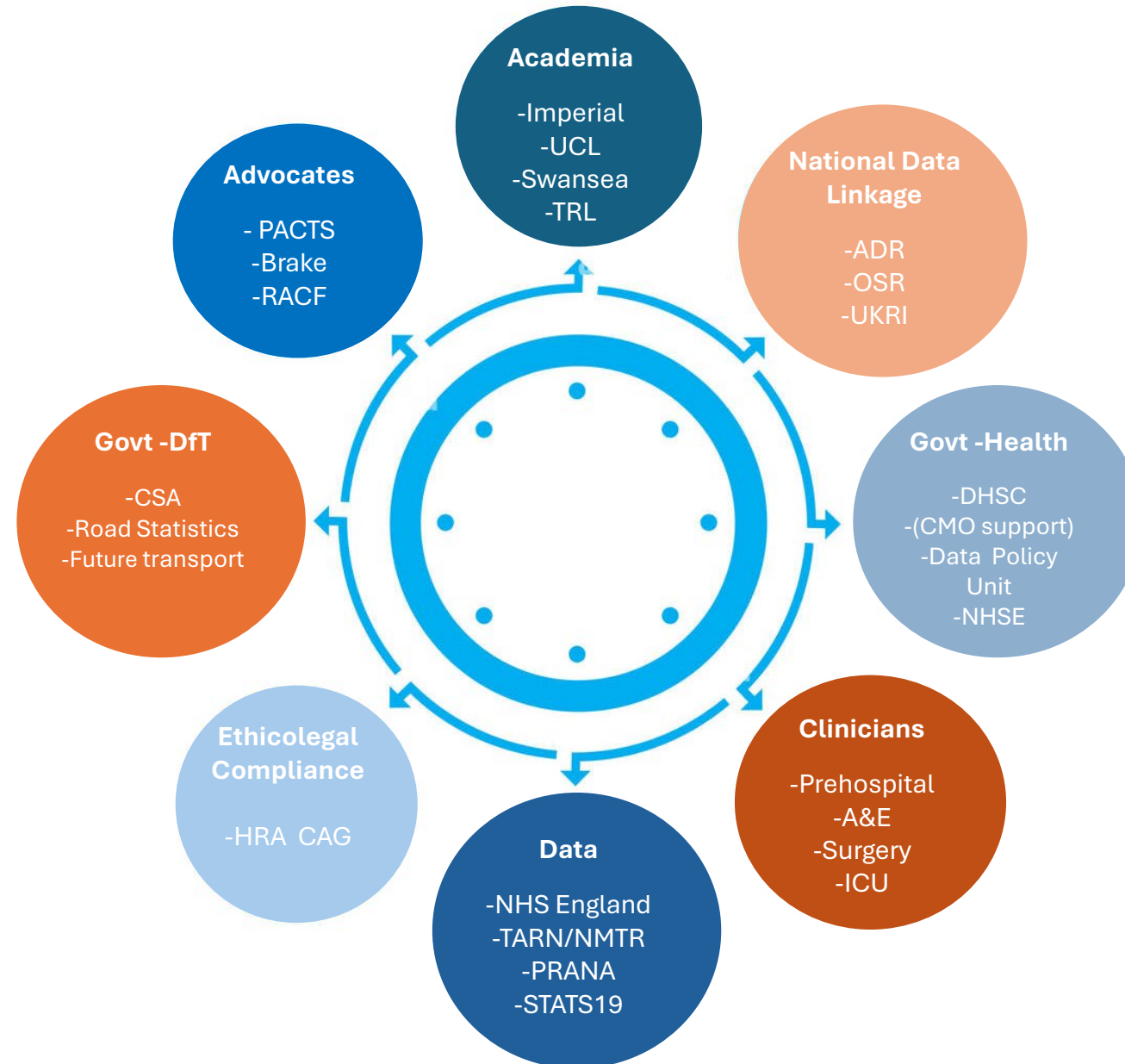
Output

- gold standard national statistics
- inform interventions

Hallmarks

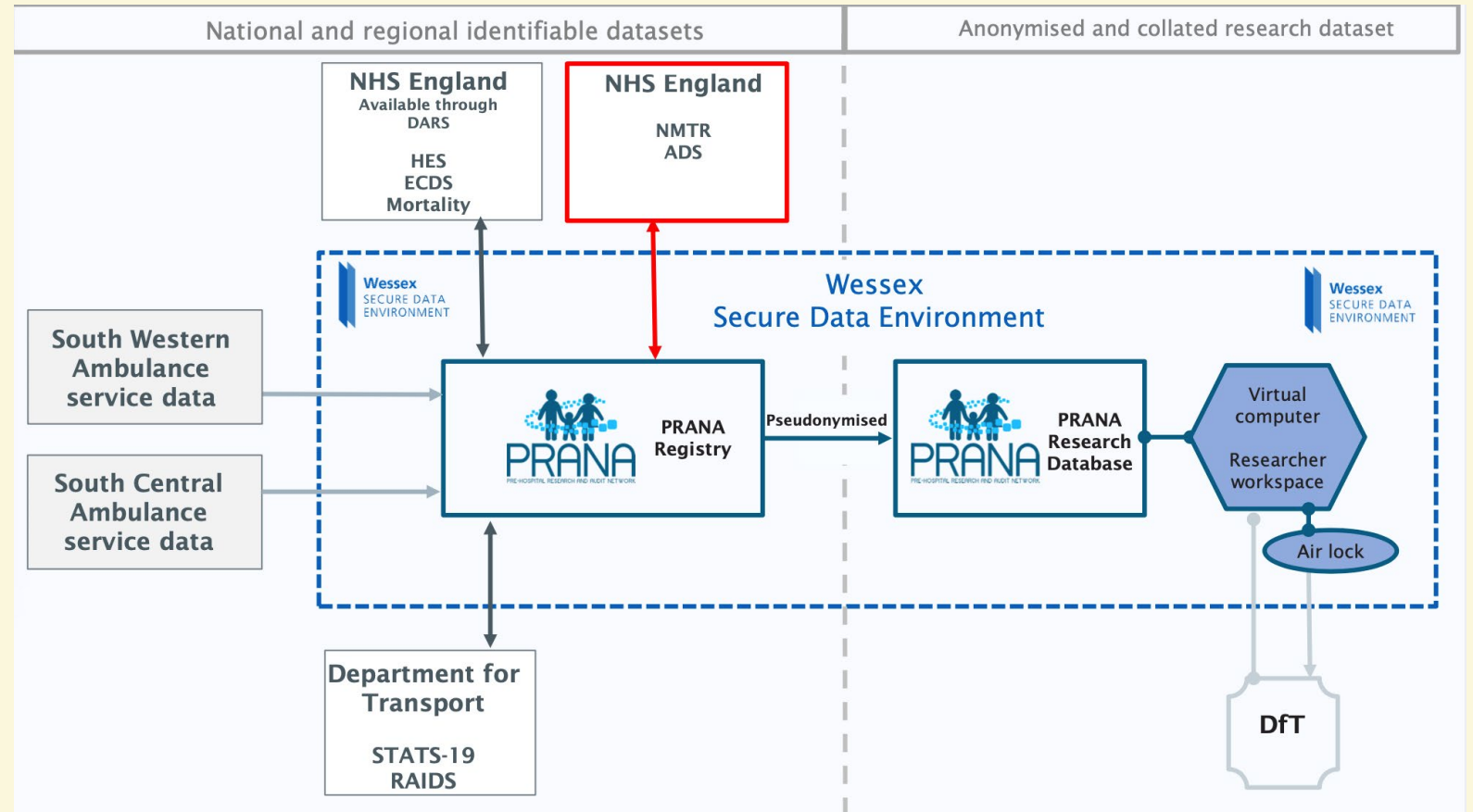
for a gold standard national linked road safety data

Roundtable Attendees



Roundtable outcomes

- Agreement and commitment to collision-health data linkage from stakeholder attendees
- Establish multi-sectoral steering or oversight committee (Easter 2025)
- Pilot work building on PRANA
 - a/w data from NHSE (pending)
 - preliminary analysis on fatality group and severity thresholds e.g. MAIS3+ (Sept 2025)
- Discuss what the ideal linked road safety dataset for national statistics may look like
- Develop a roadmap for next steps & the future



PRANA - Data Sustains Lives data flow

Thank you

s.yalamanchili@imperial.ac.uk

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