

Exercise = the 'miracle cure' for health
Active travel = the best way to get this

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www.scarlettmcnally.co.uk Twitter [@scarlettmcnally](https://twitter.com/scarlettmcnally)

I have no conflicts of interest

- Part-time NHS surgeon



- ½ day Deputy Director



- I donate £ from my column **thebmj** to charity:



- £0



My work



The Royal College of Surgeons - Council April 2012

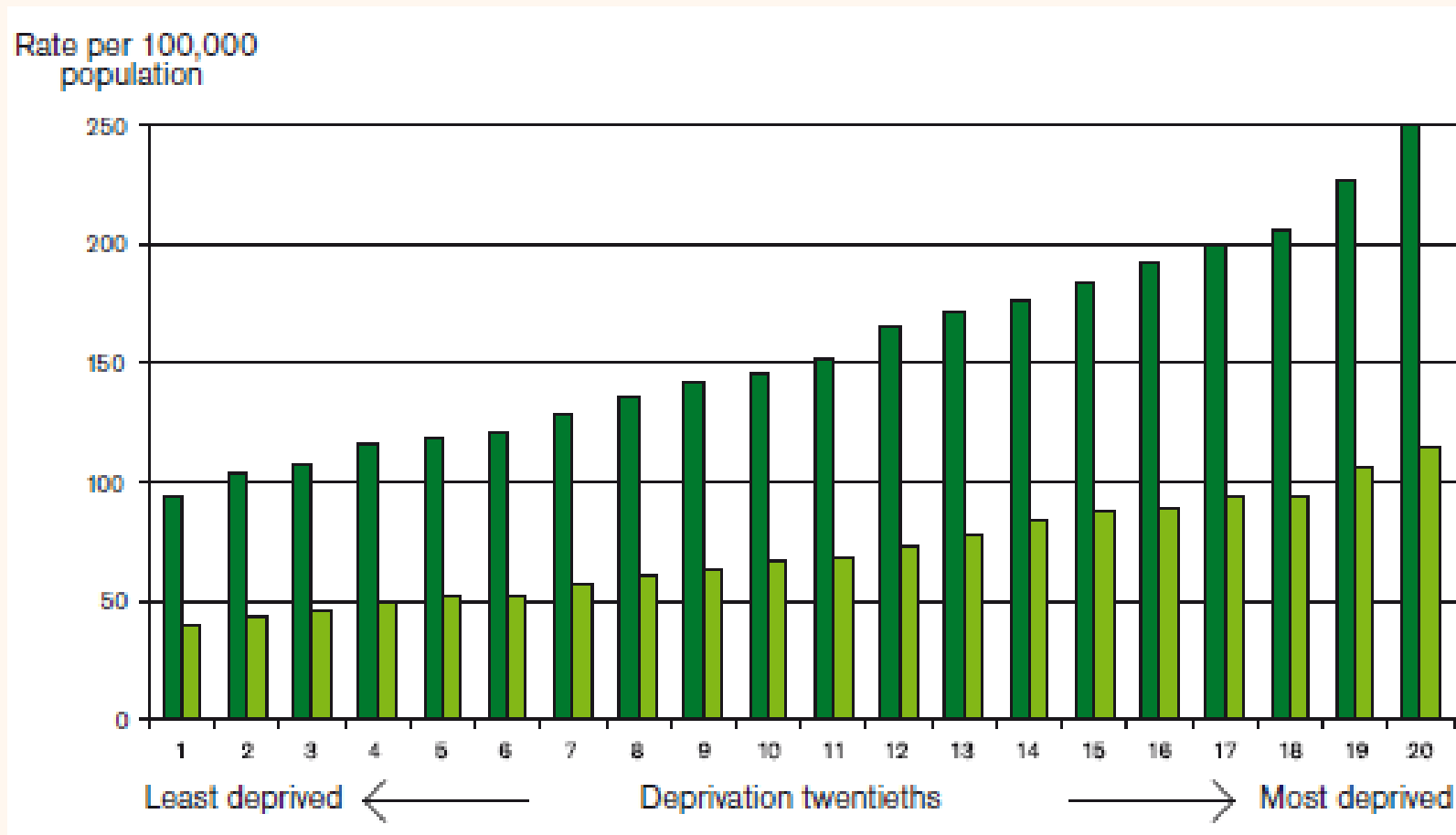
What's the most dangerous activity you can do?



Sitting down!

- Most ill-health is caused by
 - Social deprivation
 - Sedentary lifestyle (car, computer, sofas)
 - Smoking
- **Genetics** is only responsible for:
 - 20% of ill-health Rappaport (2016) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4841510/>
 - 10% of cancers WCRF (2018) <https://www.wcrf-uk.org/uk/latest/press-releases/more-public-awareness-around-preventing-cancer>
- **Bad luck** varies!

Biggest predictor of ill-health is social deprivation



If in most deprived area
2½ times more likely to get:

- heart disease
- cancer

Dose-dependent curve,
i.e. real effect

What causes ill-health?

Social cause

- Social deprivation / poverty
- Parenting
- Pollution
- “Accidents”, etc

Physical cause

1. Nutrition
2. Smoking
3. Physical inactivity
4. Alcohol excess
5. Pollution

Exercise: The miracle cure and the role of the doctor in promoting it

February 2015

- I was lead author for this
- Academy of Medical Royal Colleges = ALL specialties & GP & Public Health
- at www.scarlettmcnally.co.uk

Reduction in risk with
DOSE = 150 minutes/week

Treats?

UK lifetime
risk

Dementia

30%

✓

15%

Stroke

30%

✓

20%

Bowel cancer

40%

✓

6%

Breast cancer

25%

✓

12% women

Type 2 Diabetes

30-80%

✓

6%

Heart disease

30-80%

✓

40%

High Blood Pressure

up to 50%

✓

50%

Lung diseases

30%

✓

20%

Depression

30%

✓

15%

Osteoporosis

up to 50%

✓

50%

Falls

30-50%

✓

30%

ACADEMY OF
MEDICAL ROYAL
COLLEGES

Exercise:
The miracle cure and
the role of the doctor
in promoting it

February 2015

Healthy transport = Healthy lives

July 2012



Start Active, Stay Active

A report on physical activity for health from the four home countries' Chief Medical Officers

Protecting and improving the nation's health

Everybody active, every day

An evidence-based approach to physical activity

Clustering of unhealthy behaviours over time

Implications for policy and practice

TheKingsFund

Ideas that change health care

Authors
David Buck
Francesca Frosini

August 2012

Walking and cycling: local measures to promote walking and cycling as forms of travel or recreation

Issued: November 2012

NICE public health guidance 41
guidance.nice.org.uk/ph41

Professional Activities

Social Determinants of Health – What Doctors Can Do

October 2011

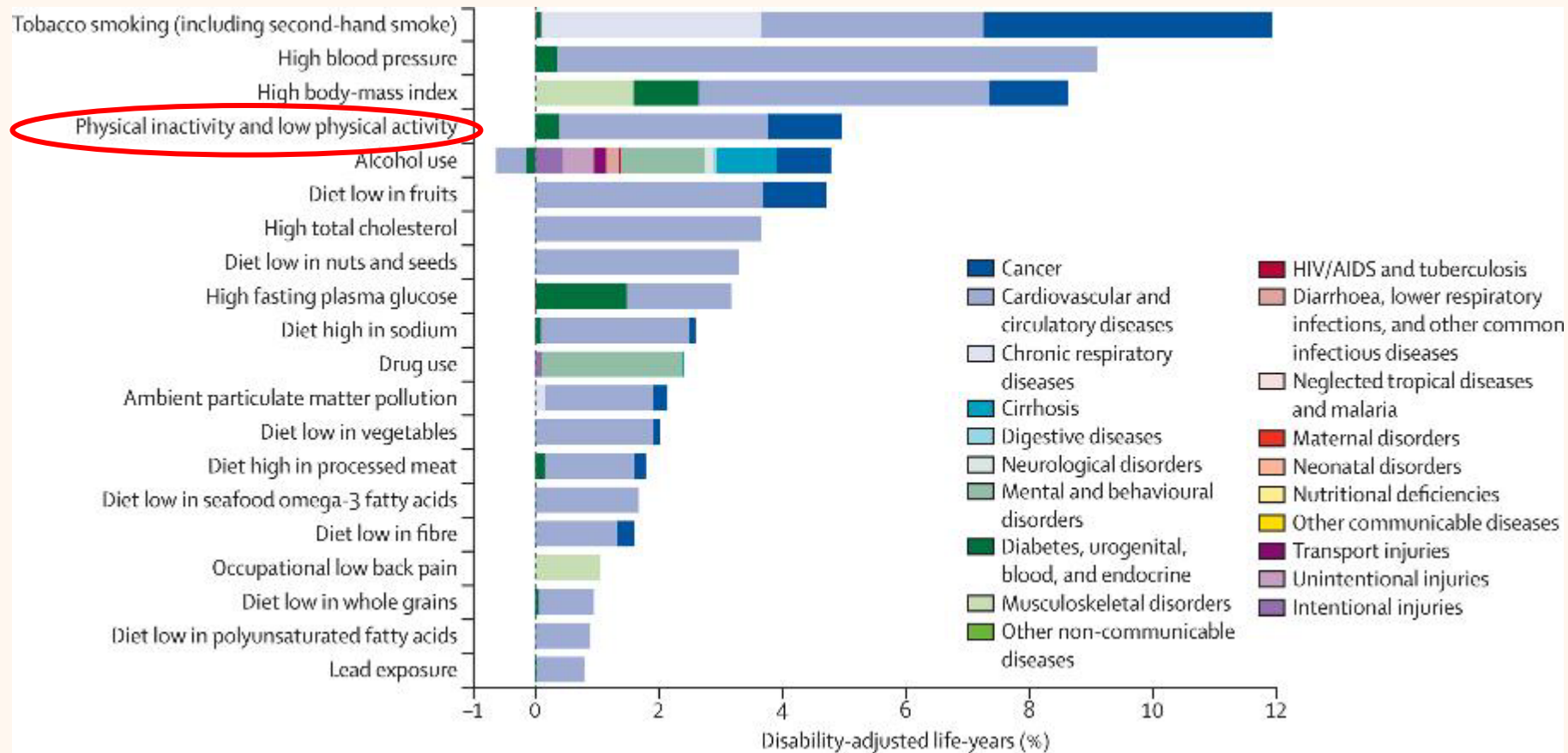
At least five a week
Evidence on the impact of physical activity and its relationship to health
A report from the Chief Medical Officer, 2004



For UK (in the Lancet 2013):

GBD = Global Burden of Disease

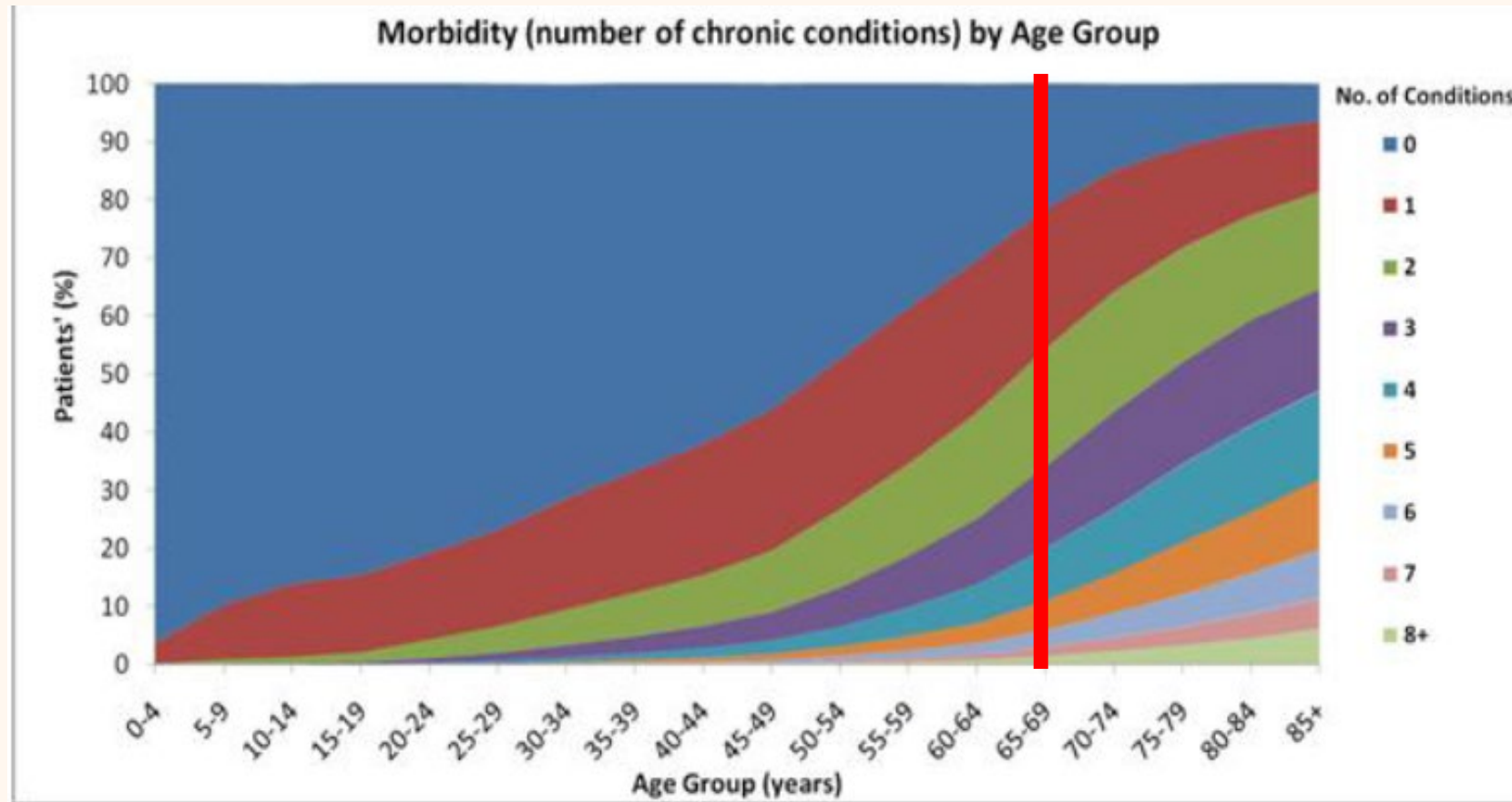
DALY = “Disability Adjusted Life Years”



UK health performance: findings of Global Burden of Disease Study 2010 DOI:

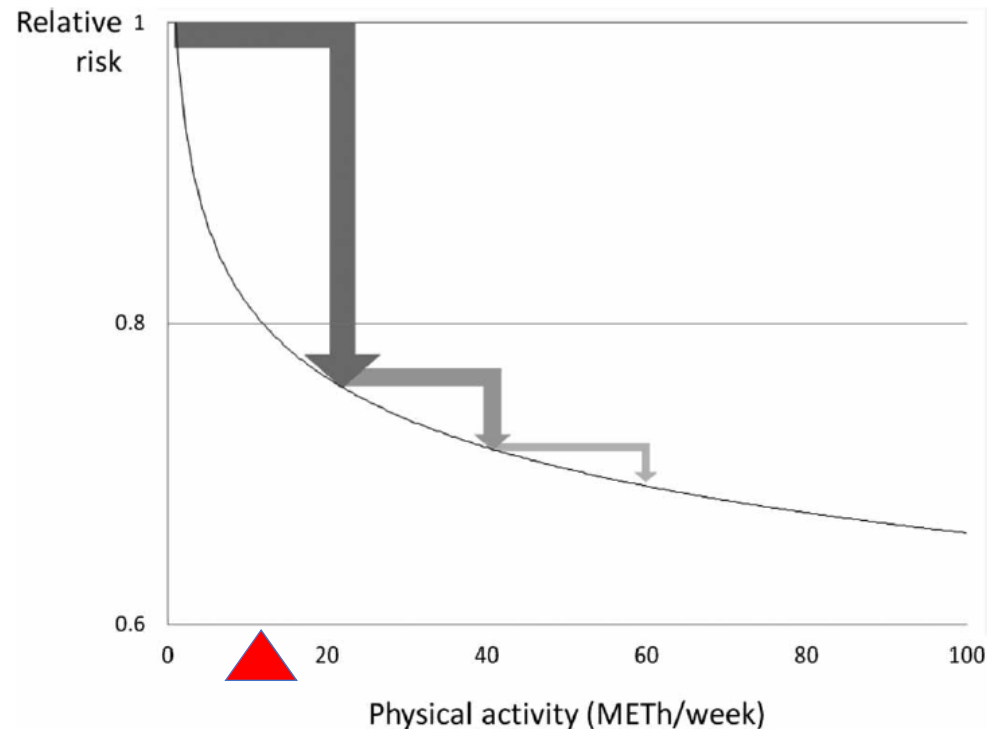
[https://doi.org/10.1016/S0140-6736\(13\)60355-4](https://doi.org/10.1016/S0140-6736(13)60355-4) www.scarlettmcnally.co.uk scarlett.mcnally@nhs.net

Multiple conditions (line = age 65)



Barnett et al Lancet May 2012

Biggest benefit for those who do least now. (Gains up to one hour exercise/day)



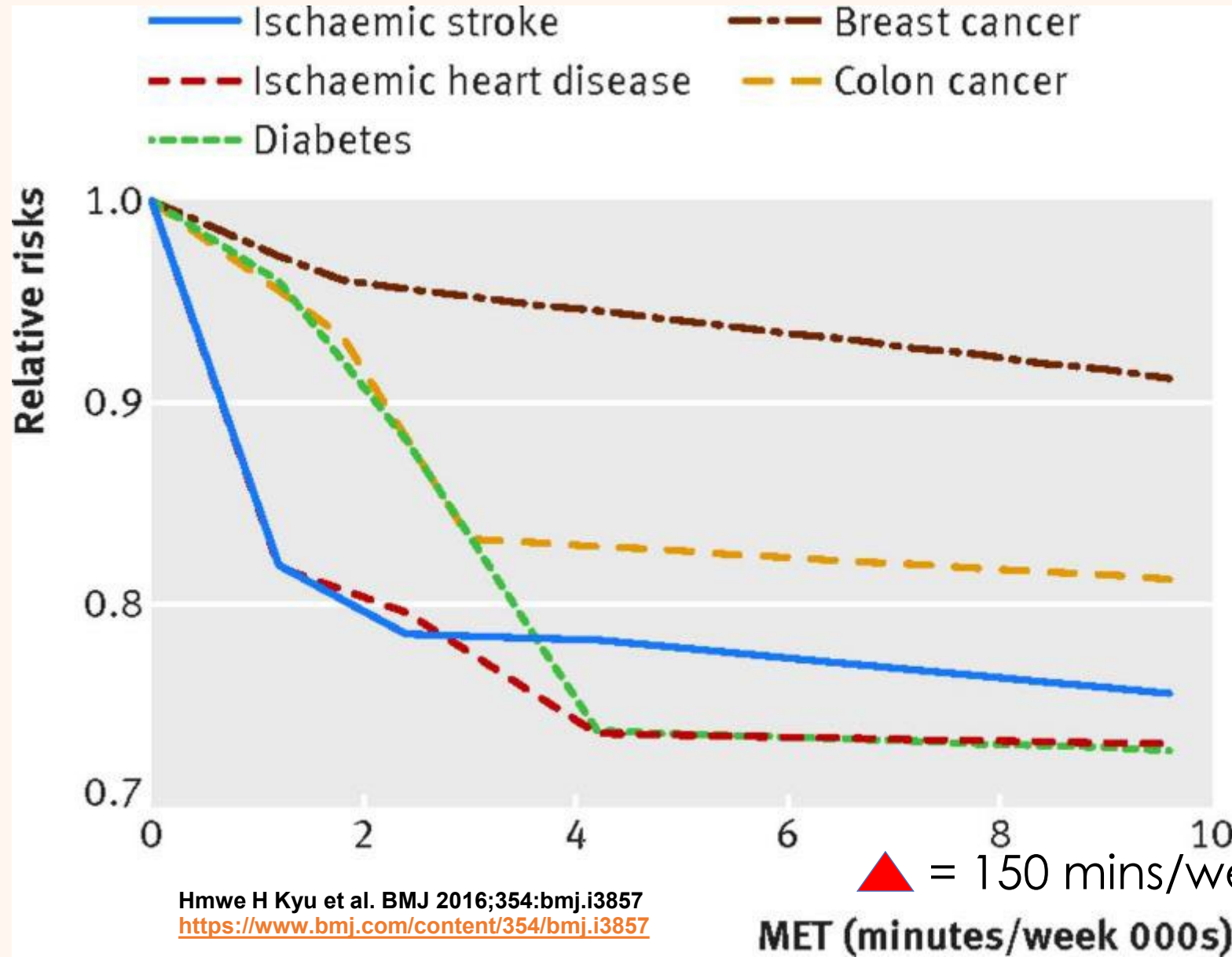
▲ = 150 mins moderate cycling

Figure 3. Illustration of the nonlinear dose–response relationship between physical activity and risk reduction (e.g. for mortality). Depending on the level of other physical activity, the same dose of cycling (horizontal segment of the arrows) will lead to considerably different risk reductions (vertical segments of the arrows).

Götschi T, Garrard J, Giles-Corti B (2015): Cycling as a Part of Daily Life: A Review of Health Perspectives, Transport Reviews: <http://dx.doi.org/10.1080/01441647.2015.1057877>



Fig 7 Continuous risk curves for association between physical activity AND



Hmwe H Kyu et al. BMJ 2016;354:bmj.i3857
<https://www.bmj.com/content/354/bmj.i3857>

▲ = 150 mins/week moderate cycling

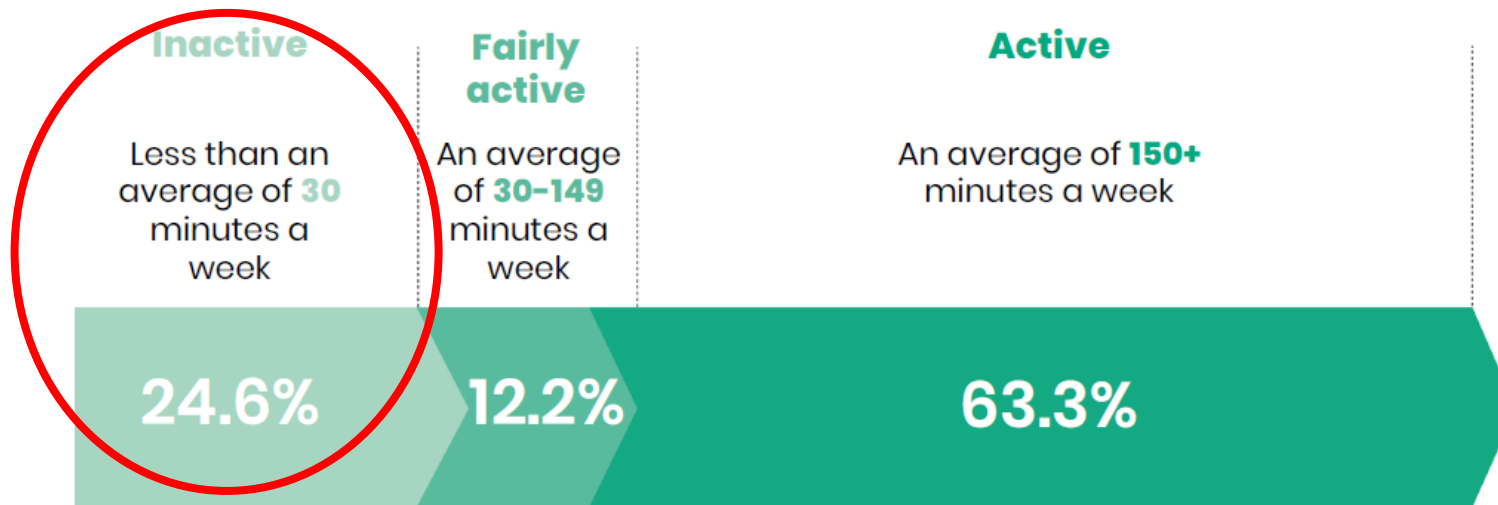
¼ adults do NO exercise
47% of over 65s do NO exercise

Levels of activity



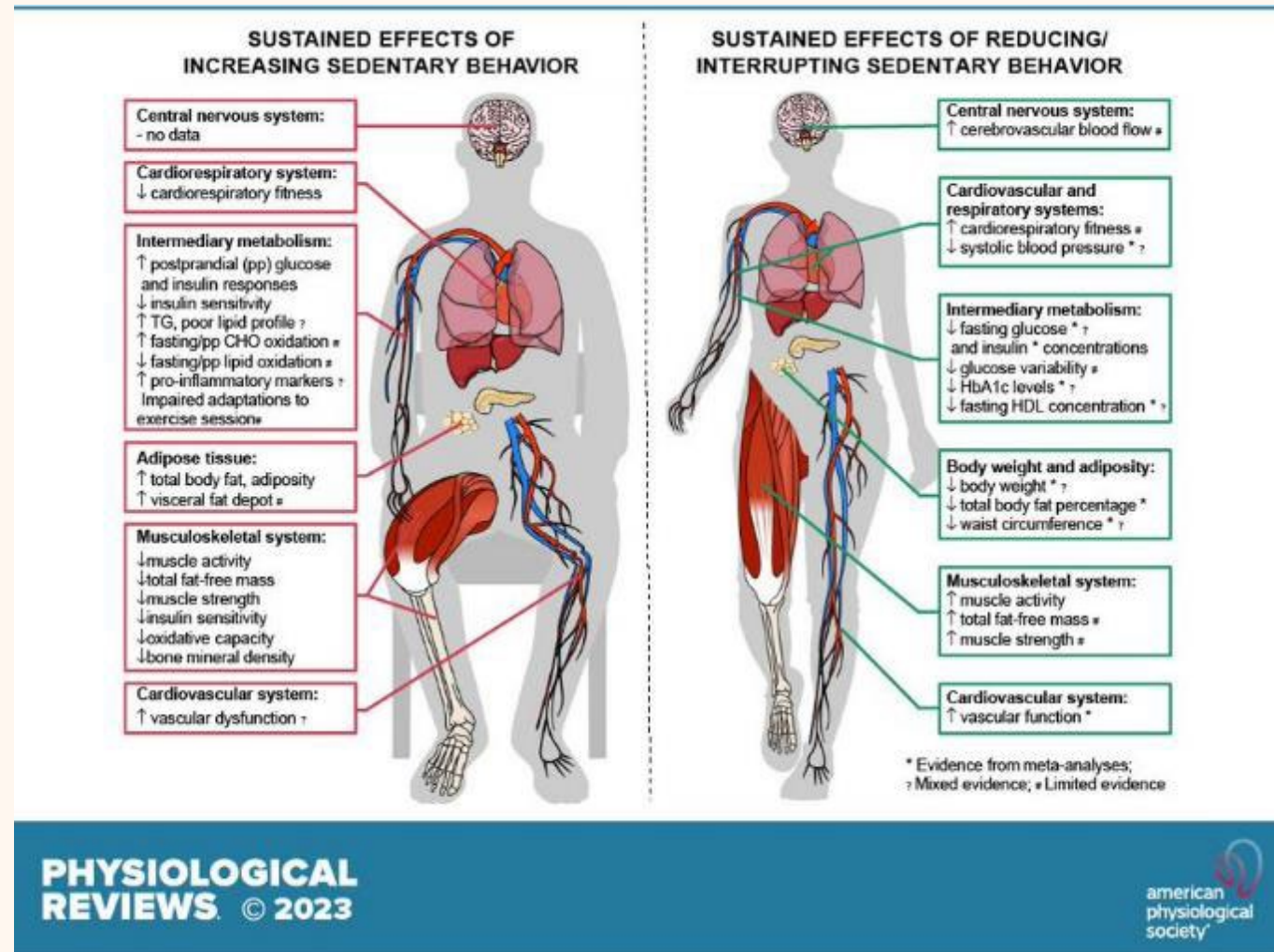
Headlines

Our data shows that between mid-November 2018 and mid-November 2019, just over six in 10 adults (28.6m) achieved 150+ minutes of activity a week.



Sedentary is bad + Exercise is good

- Metabolism (sugar)
- Inflammation (cancer)
- Mental health
- Strength (get to toilet)
- Heart
- Reserve



Pinto et al <https://journals.physiology.org/doi/abs/10.1152/physrev.00022.2022?journalCode=physrev>

Chris Whitty. Nov 2023

Chief Medical Officer's Annual Report 2023 Health in an Ageing Society

Figure 4.1: Graph illustrating that the greatest health benefits are gained from increasing weekly physical activity from 0 minutes to 100 minutes

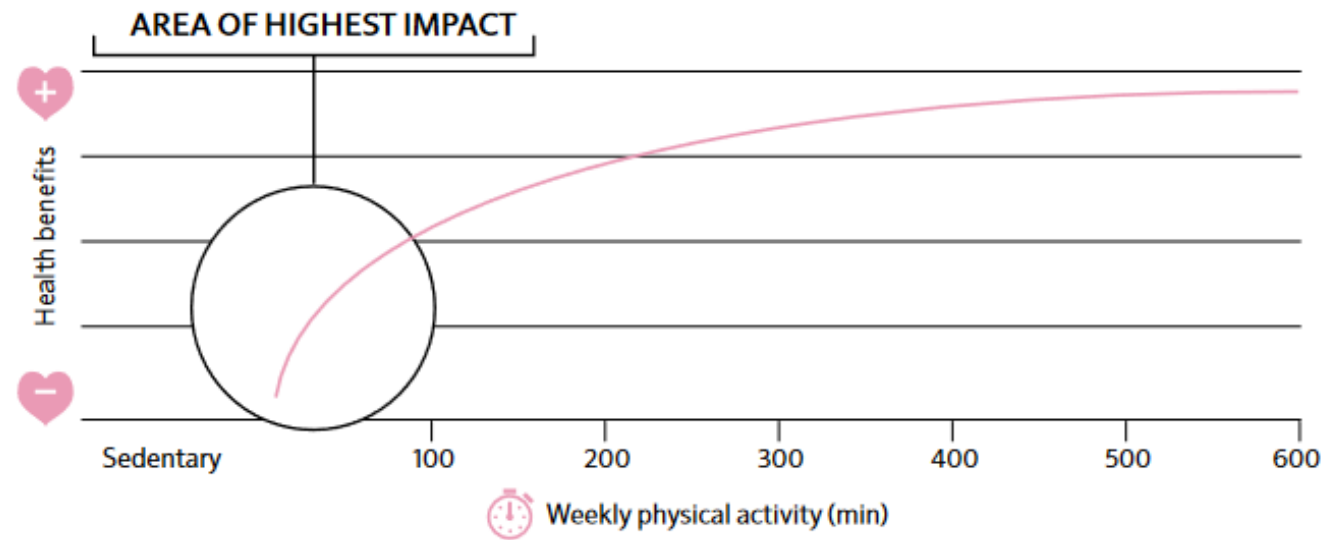
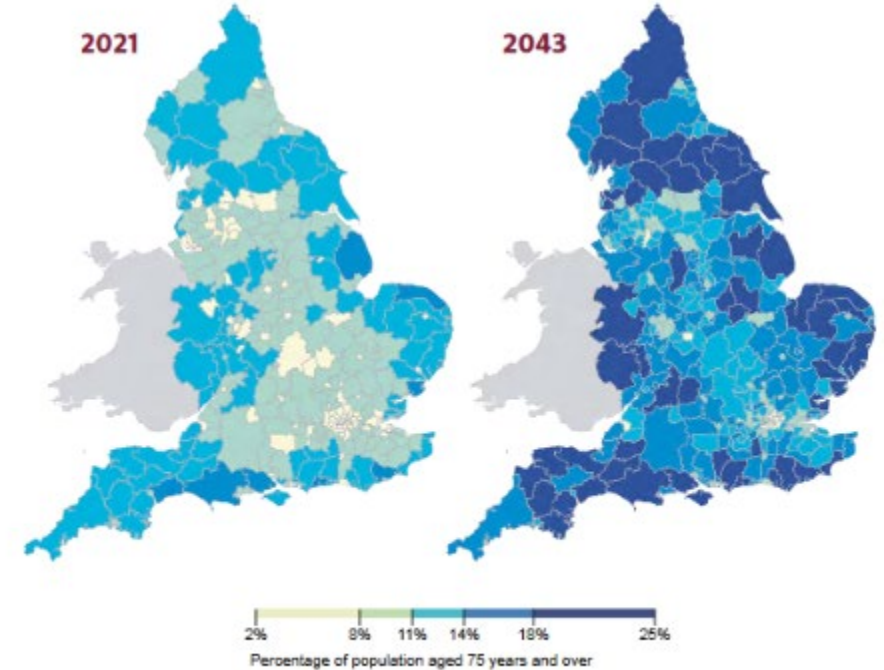


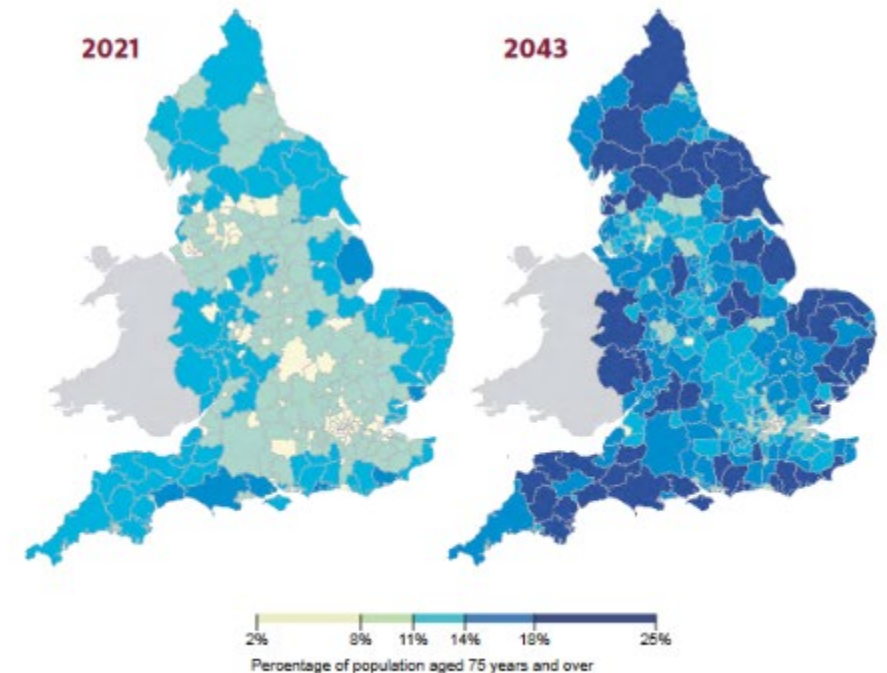
Image source: UK Chief Medical Officers' physical activity guidelines (2019)⁷



Chris Whitty. Nov 2023

- Active travel enables older adults etc to embed physical activity into everyday routine and gain health benefits.
- Consider accessibility for older adults
 - terrain of walking paths
 - active travel routes connected to amenities.
- Being physically active throughout the life course
 - maintaining good health
 - improve muscle strength - for functional independence
 - delay onset of ill health.

Chief Medical Officer's Annual Report 2023 Health in an Ageing Society

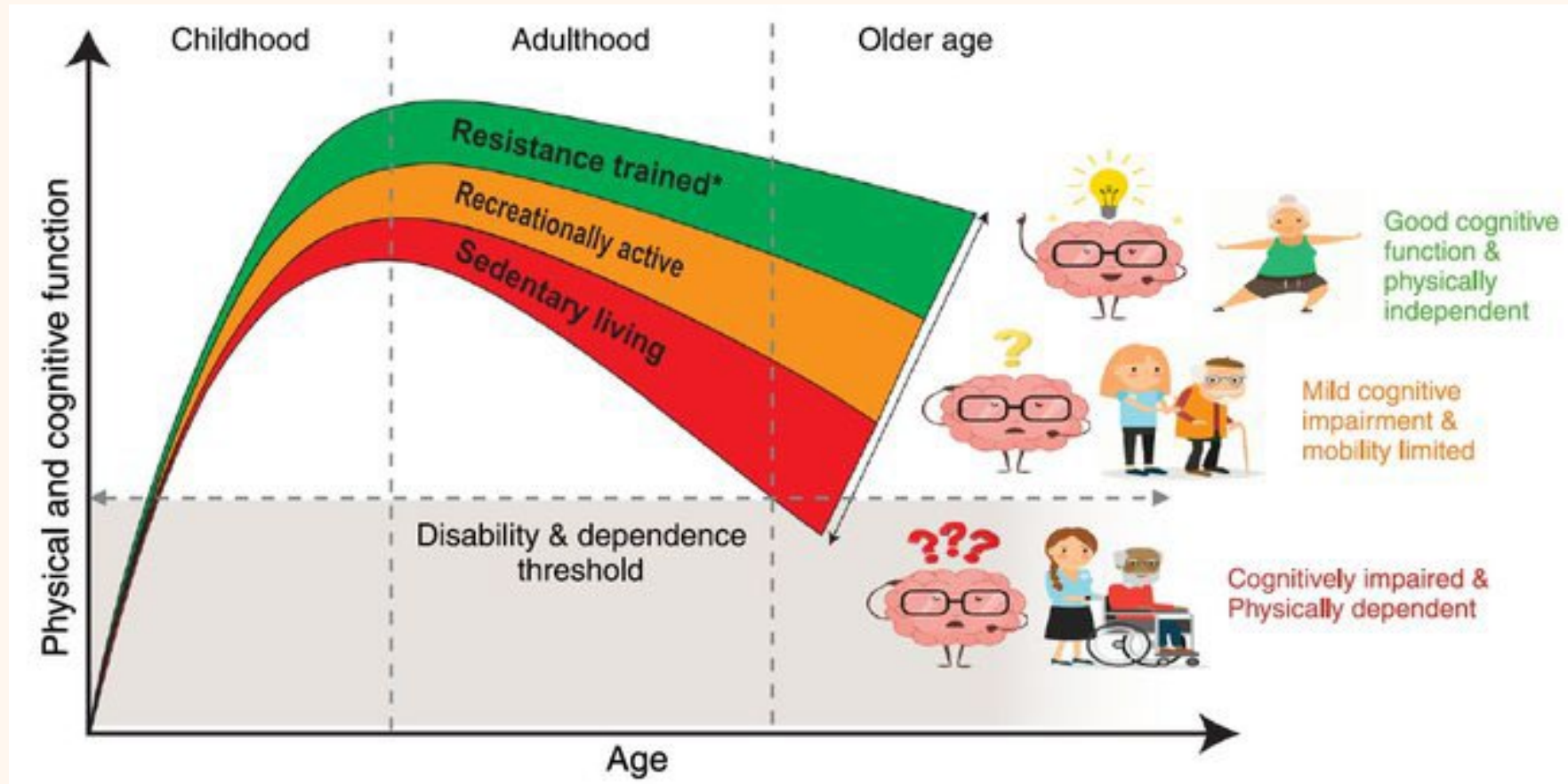


My BMJ paper at www.scarlettmcnally.co.uk



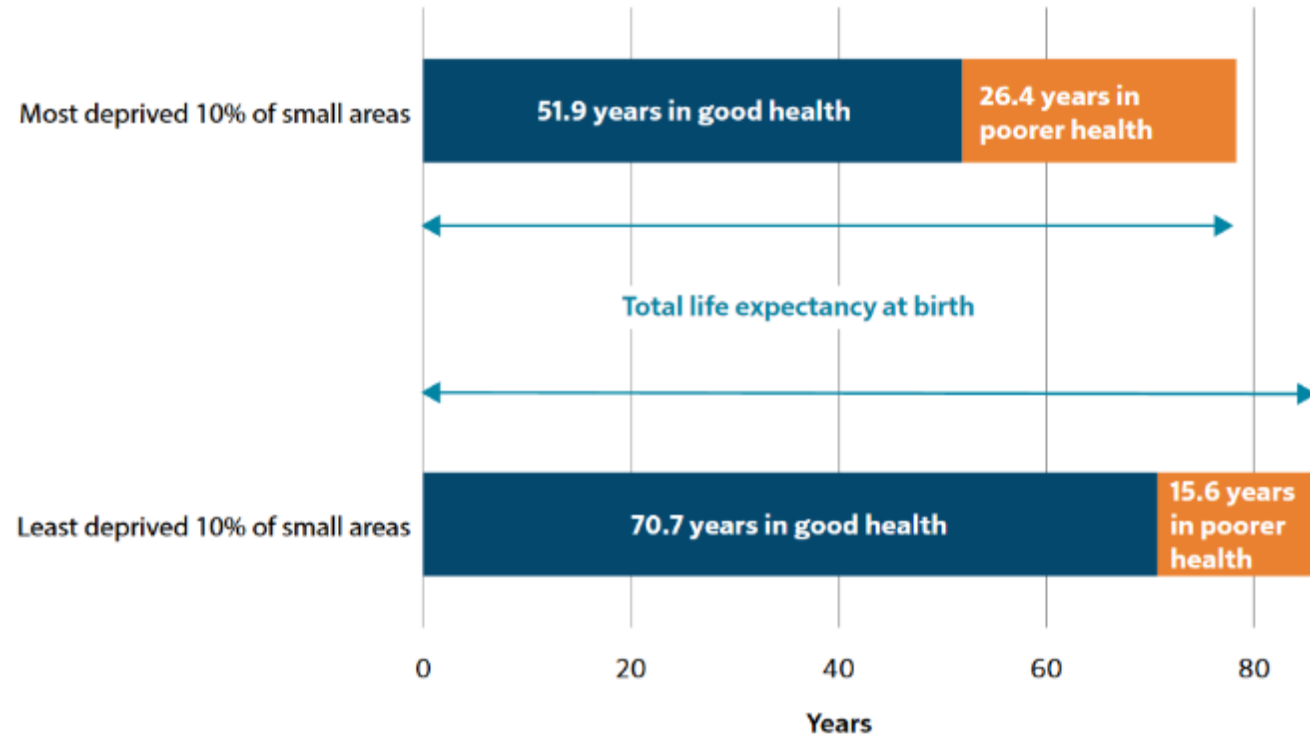
The screenshot shows the top portion of a BMJ paper. At the top left is the 'thebmj' logo. Below it, the text reads 'BMJ 2017;359:j4609 doi: 10.1136/bmj.j4609 (Published 2017 October 17)'. On the right side, it says 'Page 1 of 4'. A thick red horizontal bar spans the width of the page. Below this bar, on the left, is a 'Check for updates' button with a circular icon. To the right of the bar, the word 'ANALYSIS' is written in large, bold, red capital letters. Below a thin horizontal line, the main title of the paper is displayed: 'Focus on physical activity can help avoid unnecessary social care'. Underneath the title is a short summary: 'A concerted effort to provide support and opportunities for physical activity can help older adults maintain independence and lessen the costly burden of social care, argue Scarlett McNally and colleagues'. At the bottom of the screenshot, the authors are listed: 'Scarlett McNally consultant orthopaedic surgeon¹, David Nunan senior researcher², Anna Dixon chief executive³, Mahiben Maruthappu health executive⁴, Kenny Butler health and wellbeing lead⁵, Muir Gray public health doctor⁶'.

- Ageing is different from lack of fitness
- Start exercise:
 - Can “drop a decade” in better fitness
 - Reduce need for social care



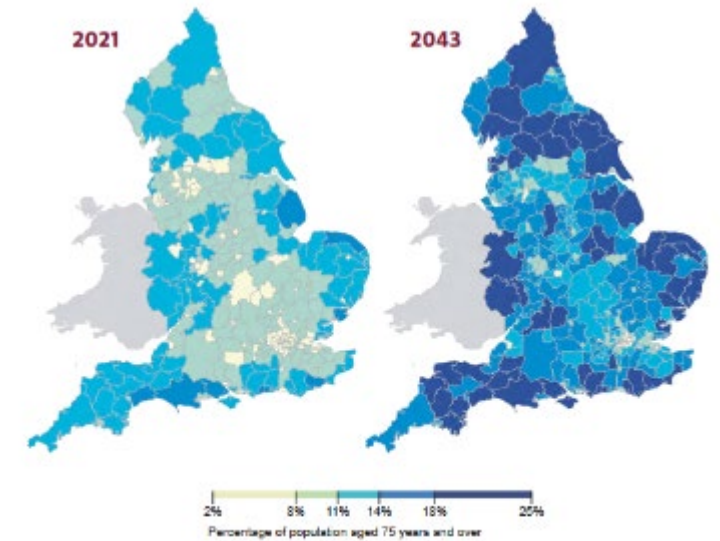
Sawan et al 2023 https://journals.lww.com/acsm-esm/fulltext/2023/01000/the_health_benefits_of_resistance_exercise_beyond.2.aspx
[@jacksonfyfe](#)

Figure 3: Inequality in life expectancy and healthy life expectancy at birth for females in the most and least deprived areas in England, 2018 to 2020



Chief Medical Officer's Annual Report 2023

Health in an Ageing Society



To change needs:

WHY

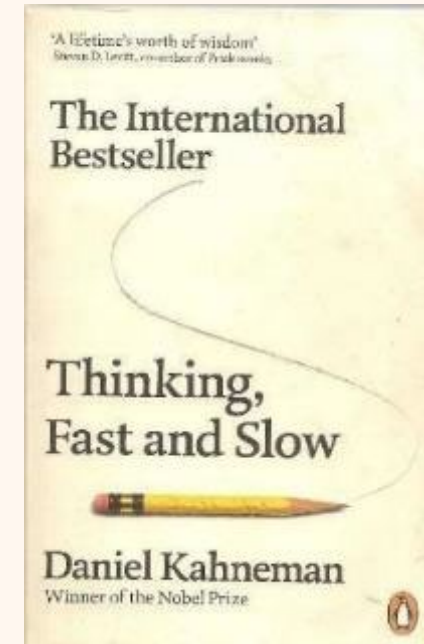
- Stories
- Data

HOW

- Practicalities (waterproof trousers, chargers)
- “Normalise” culture
- NHS as anchor institution
- Funding

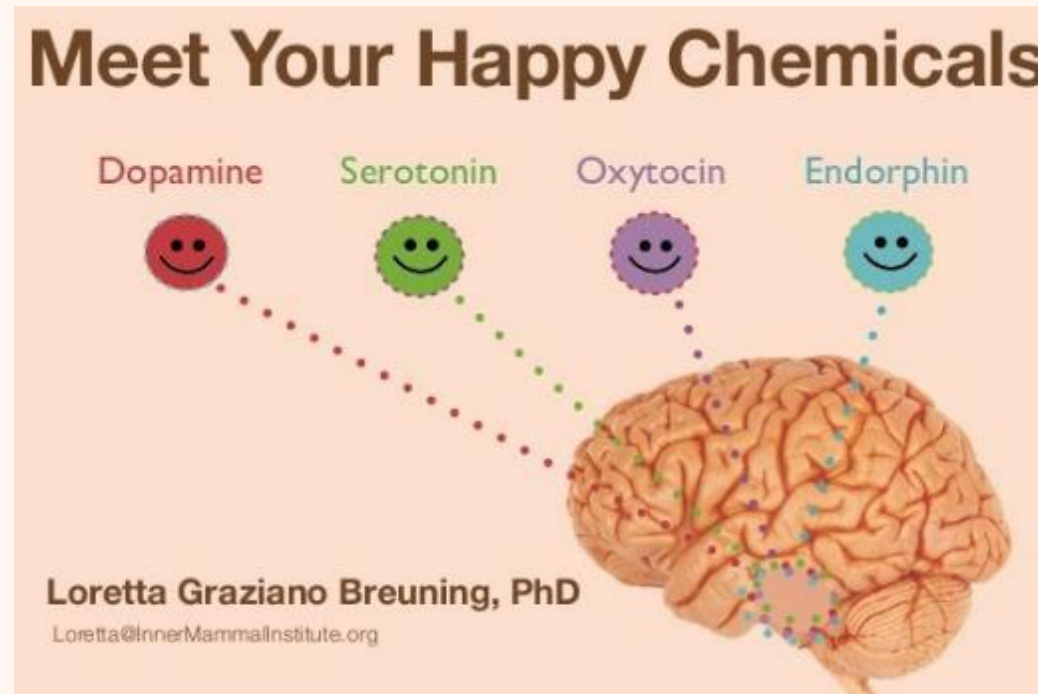
Habit + plan for failure

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Why do we ever do anything?

1. **Dopamine**: set goals, mini-rewards (vs. procrastinate)
2. **Serotonin**: be included + sun/UV **Sign up for charity walk/run/cycle!**
3. **Oxytocin**: gifts, hugs, sex, memories, doing a good deed
4. **Endorphins**: exercise, comedy, laughter **TAKES 20 minutes to work!**



62% UK adults say it is too dangerous to cycle on the roads.

Department for Transport (2018) Statistical data set. Walking and cycling statistics (CW)
<https://www.gov.uk/government/statistical-data-sets/walking-and-cycling-statistics-cw>

Only 3.5% of walking journeys are over 2 miles.

Department for Transport, Walking & cycling statistics (2018).
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674503/walking-and-cycling-statistics-england-2016.pdf AND NTS0308: Average number of trips by trip length and main mode: England (2018)
<https://www.gov.uk/government/statistical-data-sets/nts03-modal-comparisons#trips-stages-distance-and-time-spent-travelling>

50% cycling journeys are 2 - 5 miles.

Department for Transport, Walking & cycling statistics (2018).
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/674503/walking-and-cycling-statistics-england-2016.pdf

56% of car journeys are under 5 miles.

Department for Transport, Walking & cycling statistics (2018).
<https://www.gov.uk/government/statistics/national-travel-survey-2020/national-travel-survey-2020#journey-lengths>
new one

34% to school by car. 2% by bike.

England, National Travel Survey 2016
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/476635/travel-to-school.pdf

40% reduction in cancer incidence/death in cycle commuters.

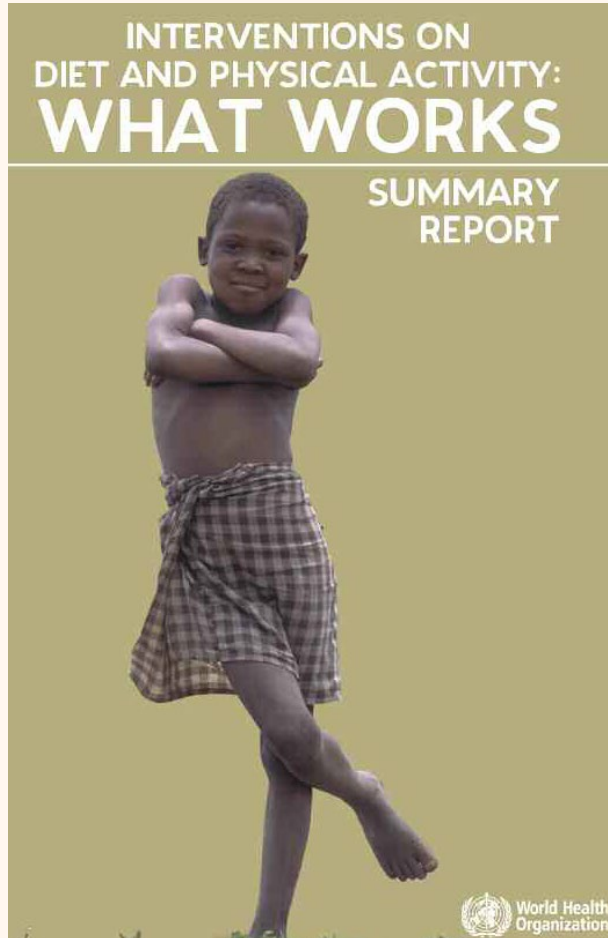
<https://www.bmj.com/content/357/bmj.j1456>

45% reduction in heart disease/death in cycle commuters

“Free and generous parking availability quadruples the odds of driving a car to work”

<https://t.co/NIUJ7cYCSV>

World Health Organization



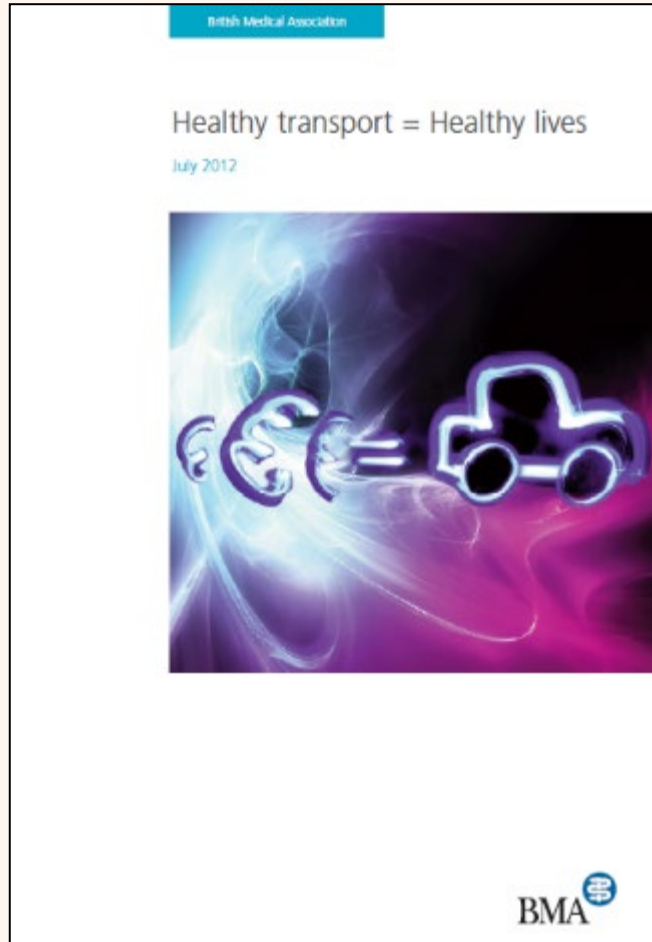
1. Government food regulations
2. Built environment
 - Active travel
 - Space for recreation
3. Using stairs (prompts)
4. Food price at point-of-sale
5. Multi-targeted:
 - walking & cycling to school
 - healthier commuting
 - & leisure activities

<https://www.who.int/dietphysicalactivity/whatworks/en/>

Chief Medical Officers' guidance for ALL



- 150 mins /week
2x strength
2x balance
- For frail older adults - focus activities
 - reduce sedentary behaviour
 - regular sit-to-stand exercise
 - short walks
 - stair climbing
 - Embed strength & balance into life
 - increase the duration of walking



“The best forms of exercise are those that fit into everyday life”

British Medical Association (BMA) 2012

Electric-cycles are a game-changer

- Physical activity levels are similar e-cyclists/cyclists
- E-cyclists switch from car for journeys

[Study of over 10,000 participants in seven European cities, Castro for PASTA(2019)

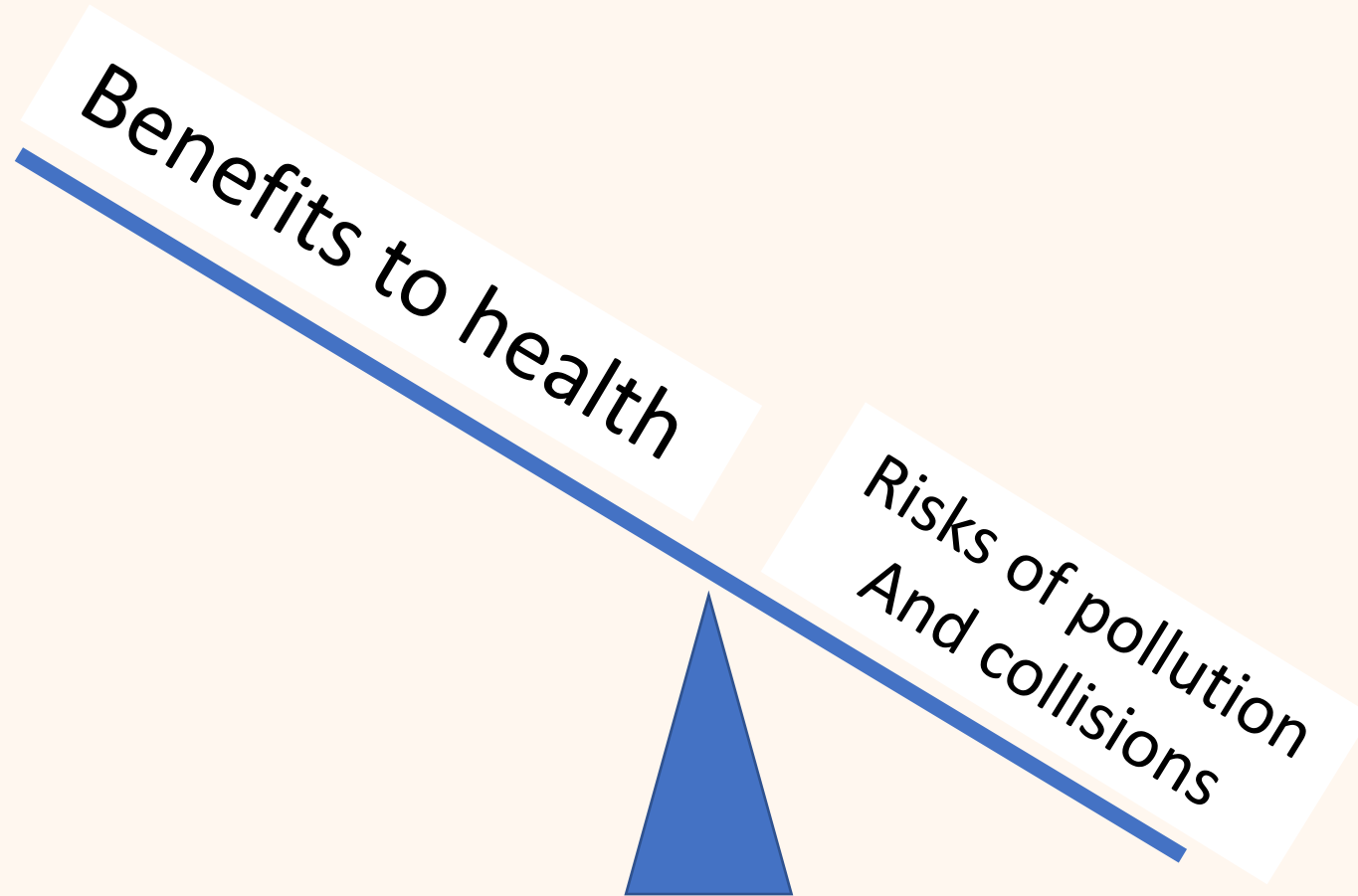
<https://www.sciencedirect.com/science/article/pii/S259019821930017X>

- Loaning 80 employees an e-cycle for 6 – 8 weeks
 - car mileage reduced 20%
 - 59% increased Physical Activity

Bjørnara (2019) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6619759/>



Health benefits of active travel outweigh risks 10:1



- Review papers: Mueller et al, 2015, Götschi et al, 2015, Tainio et al, 2016

Pollution

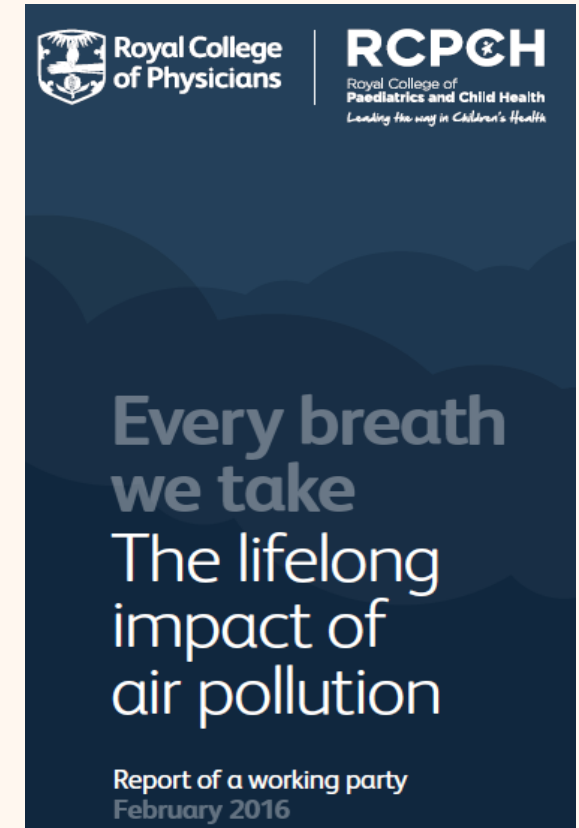
Fine particulate pollution from tyre, brake and road wear...even electric cars (by weight).

Chief Medical Officer's
Annual Report 2022
Air pollution



Harms from high pollution

- Accelerated decline in lung function
- Asthma
- Type 2 diabetes
- Poor cognition
- Heart attacks, heart failure and strokes
- Lung cancer



Royal College of Physicians | RCPCH
Royal College of Paediatrics and Child Health
Leading the way in Children's Health

Every breath we take

The lifelong impact of air pollution

Report of a working party
February 2016

<https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>

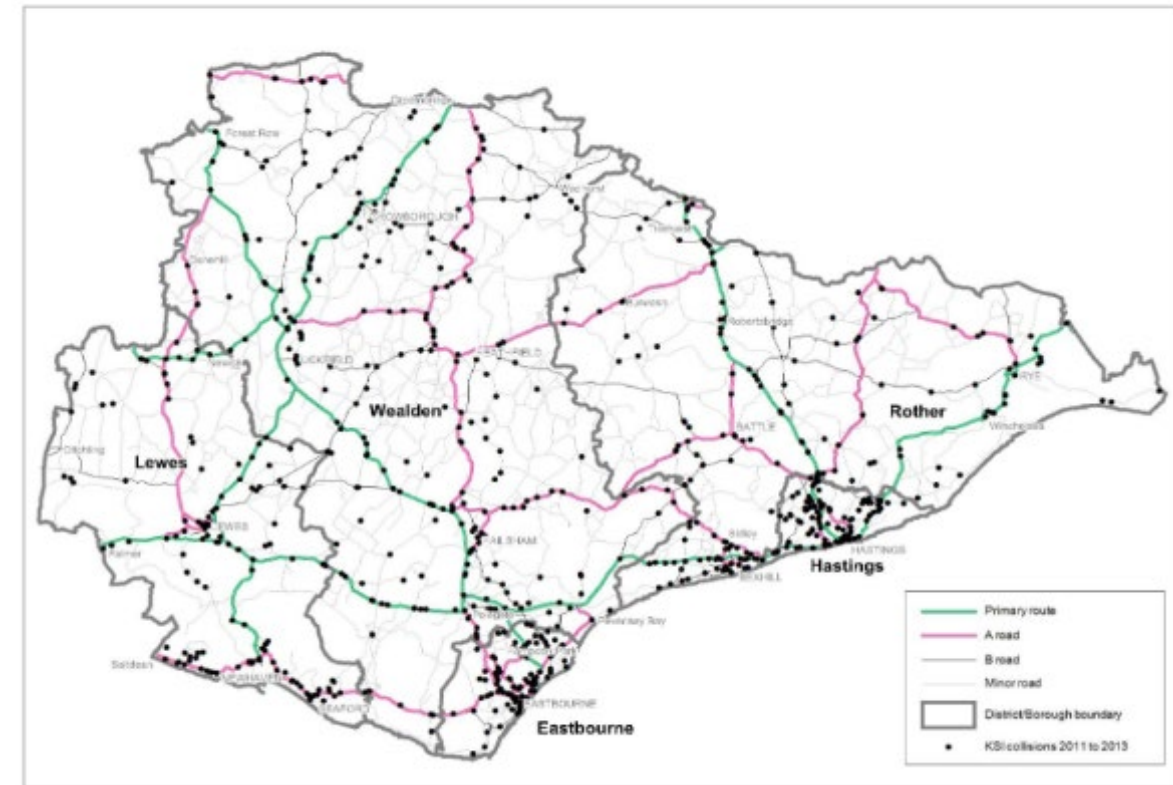


Killed or Seriously Injured (KSI) casualties on East Sussex roads

- East Sussex significantly worse than England
 - 1,298 accidents reported, 2013
 - 2,435 vehicles
 - 1,795 casualties: 322 (18%) serious + 17 (1%) fatal
- Child pedestrian injuries – bad for Europe
 - Very high in East Sussex
 - ¼ in most deprived wards = exposure to danger – high-speed traffic
 - Most 8-9am and 3-7pm. Eyes can't judge speeds
- Actions:
 - Encouraging safe active travel for children before/after school
 - Introducing 20 mph limits
 - Driver education, publicity, road engineering and enforcement.

• <https://www.eastsussexjsna.org.uk/resources/killed-or-seriously-injured-on-east-sussex-roads/>

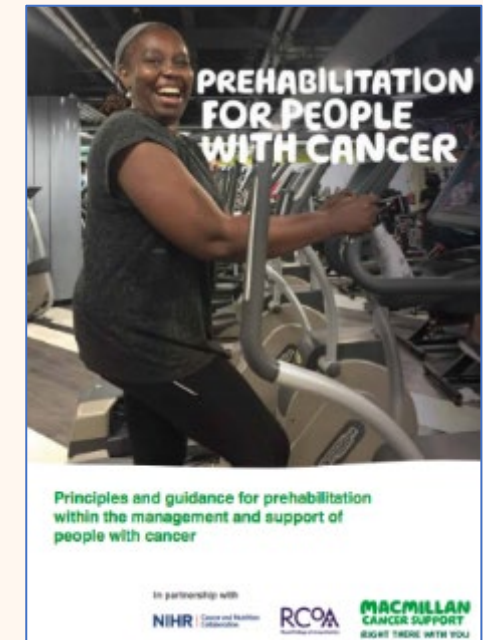
Figure 7: Location of KSI's in East Sussex 2011 to 2013



Reduce complications of surgery

A teachable moment www.cpoc.org.uk/patients

| | | |
|---------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | |
| 10-15% | of operations have a complication | |
| x5 | if frail | https://doi.org/10.1093/ageing/afy110 |
| x4 | if physically inactive | https://pubmed.ncbi.nlm.nih.gov/23534776/ |
| 30%-80% | decrease with daily exercise | www.cpoc.org.uk/cpoc-publishes-major-evidence-review-impact-perioperative-care |



Outside + water + greenery + exercise = health

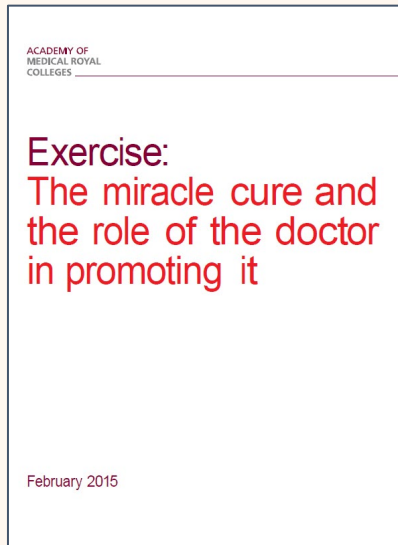


<https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667%2823%2900156-1/fulltext>

Sustainability

= REDUCE, reuse, recycle

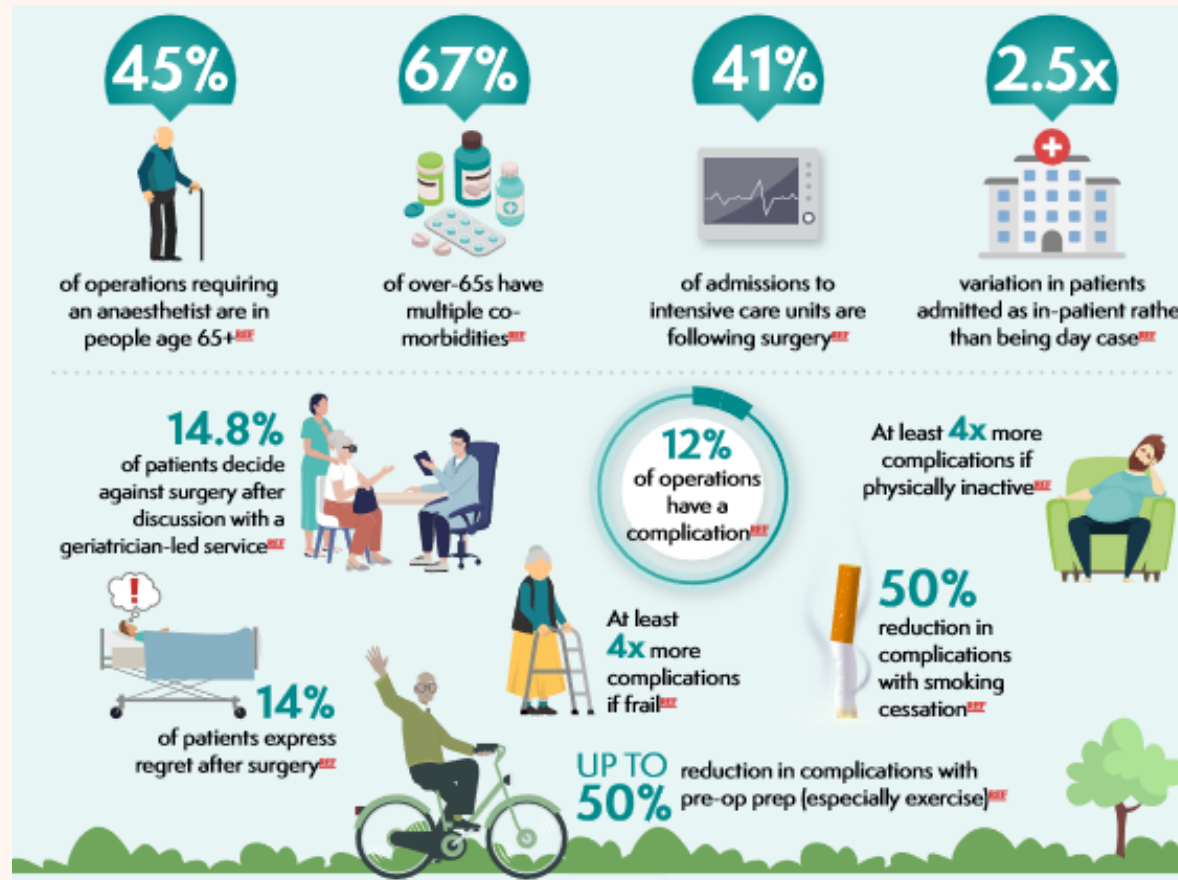
- Fewer operations
- Fewer complications
- Shorter stays
- Less ill-health



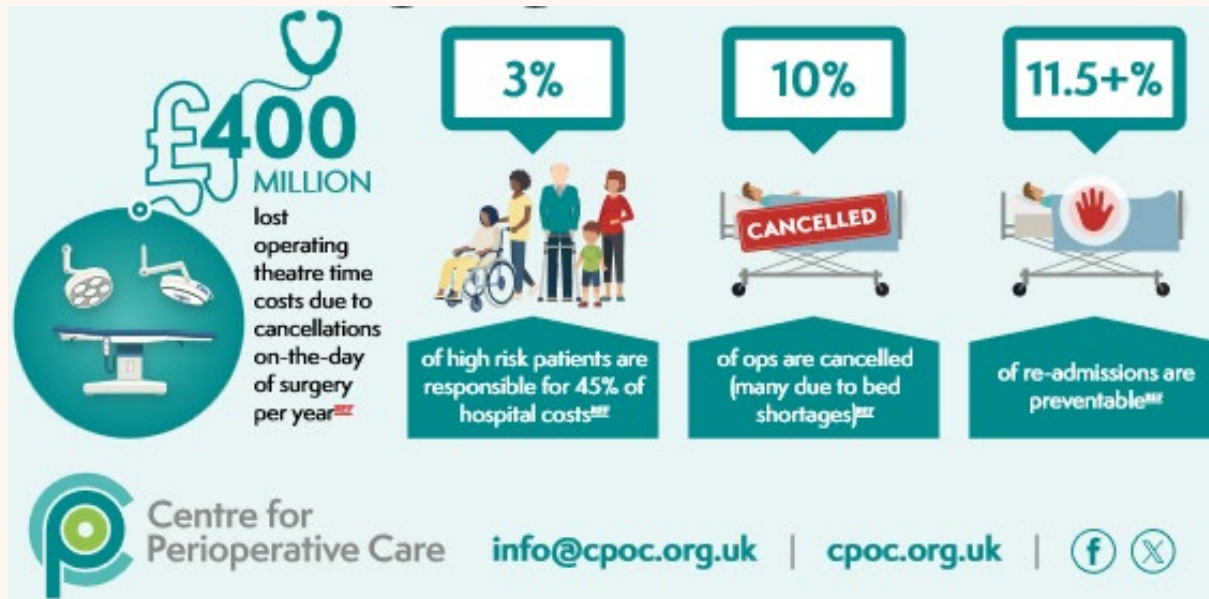
Fix the NHS waiting list

Reduce complications by 50%

Be a “day case” www.cpoc.org.uk



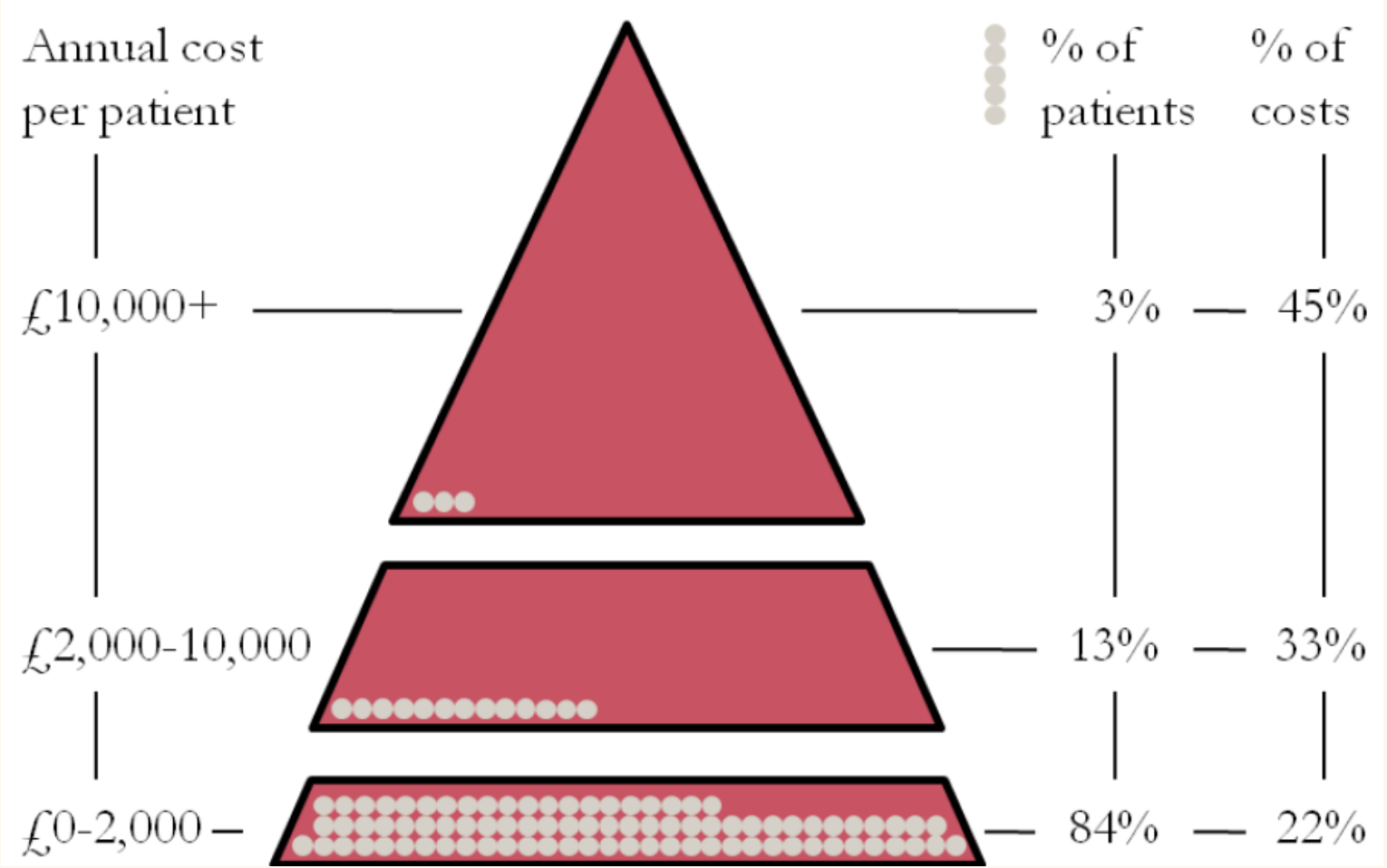
Fix the NHS waiting list
Reduce complications by 50%
Be a “day case” www.cpoc.org.uk



Why do something to support other people to be physically active?

| It is nice | We can't afford not to |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• Improves mental health• Improves physical health• Wellbeing | <ul style="list-style-type: none">• Saves NHS costs• Saves social care costs• Social care predicted to be needed for 10 years• Families reduce paid work to be carers• 6 million carers in UK• ½ ESHT revenue budget on Adult Social care• NHS costs (staff/money) for diseases that might not have happened• reduces pollution + reduces CO2 emissions + particulates from cars• Happier• Fewer sick days• More disposable income (?1 car per household)• 33% of UK adults are deficient in Vitamin D (dose = 20 mins) |

Money – Poor health is Unaffordable for NHS 3% of patients cost 45% costs

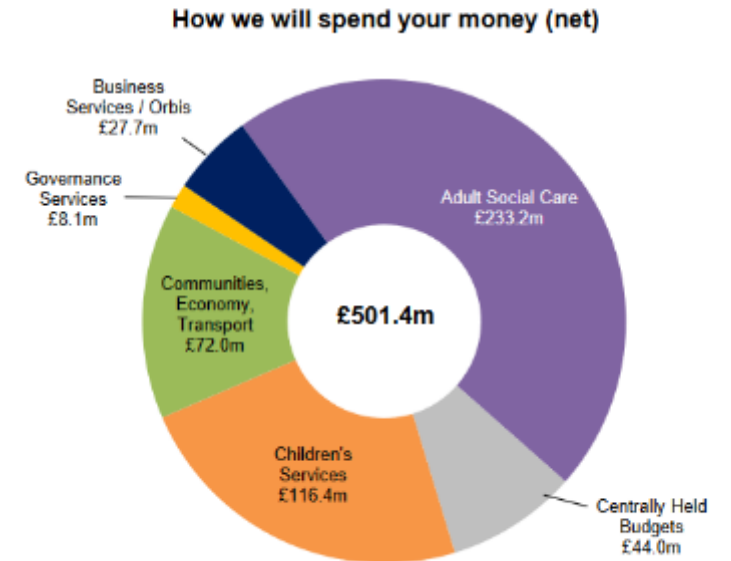


Nuffield Trust
<https://www.nuffieldtrust.org.uk/files/2017-01/patient-level-costing-full-web-final.pdf>

We can't afford not to

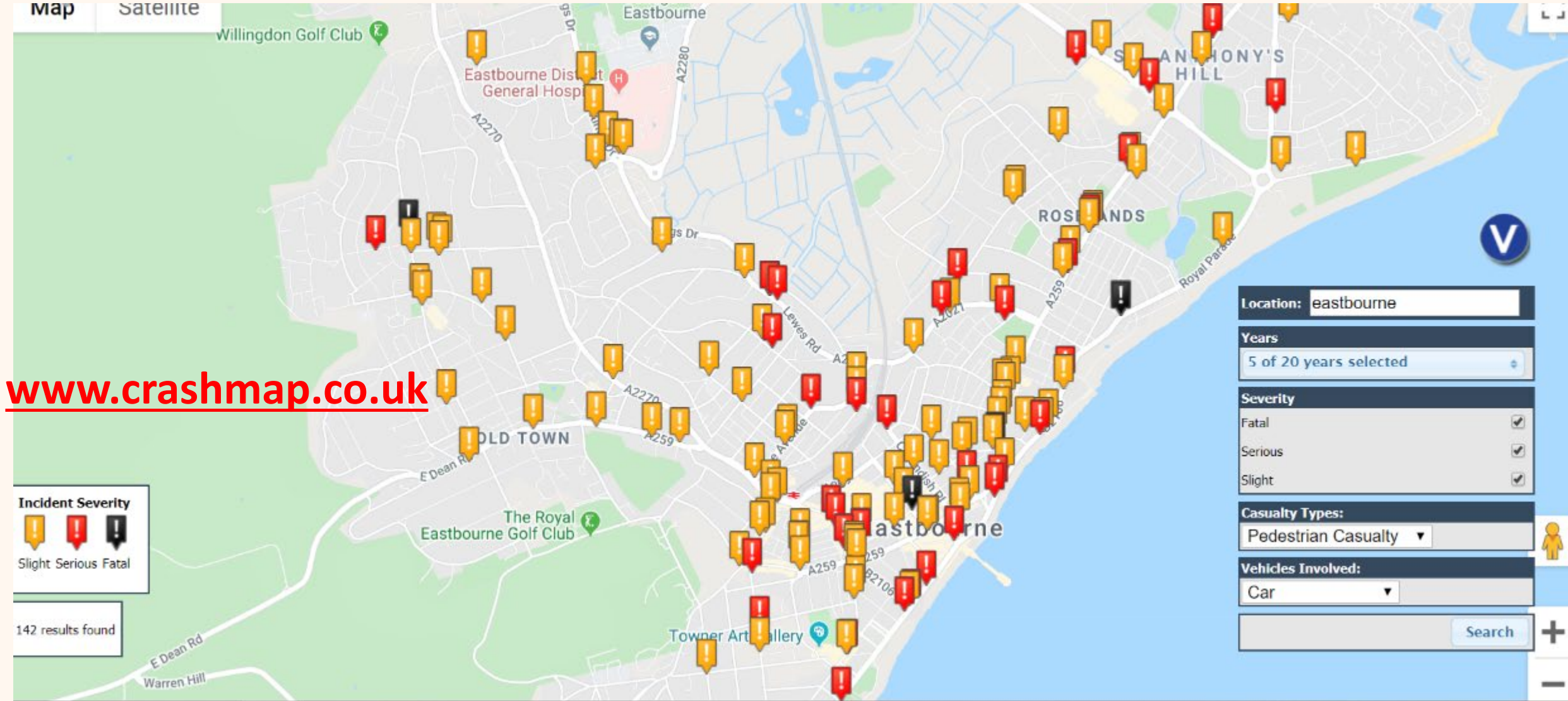
- Adult Social care is ½ ESCC revenue budget
 - <https://www.eastsussex.gov.uk/your-council/finance/future-spend/summary>
- 27.7% of people in employment in East Sussex:
 - Public administration, education, health or social care
 - <https://www.eastsussexinfigures.org.uk>

Revenue Budget Summary 2023/24 - net revenue budget





142 Pedestrian casualties hit by car in 5 years

More active travel & fewer motor vehicles would reduce collisions / injuries



1. ESCC plans to ban cycling all along Terminus Road from the station to the sea



| | Currently | What should happen |
|-------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------|
|  | Currently has motor traffic. | This should be converted to two-way cycling lanes with pedestrian crossing points |
|  | Currently has pedestrianisation with cycling permitted. | This should be retained, with speed or timing limits. |

Assessment of seafront cycle route



October 2020

Produced by Transport Initiatives & FIA



PJA

Prioritising the health of our children by reducing road traffic deaths

without acknowledging the increased road travel and resulting incidents created by expensive, new, widened roads.

When local residents petition for a zebra crossing by their school, their project joins a list of at least 79 others, and funding goes only to the top three lucky projects—but we need to prioritise making our roads safer.

Children make up 21% of the UK population. Only 76% of mothers with dependent children are in employment, compared with 92% of fathers. In a cost of living crisis, running a car is one of the biggest

household expenses. But if children can cycle, walk, or scoot to school safely, the household may need only one car. Furthermore, walking or cycling has clear benefits for health by reducing sedentary lifestyles, as well as for the environment.

We're in a vicious cycle where 34% of children are driven to school, 62% of UK adults say that it's too dangerous to cycle, and 59% of car journeys are under five miles. Only 5% of walking journeys are over two miles, so a modal shift from cars requires better infrastructure for cyclists and pedestrians, with better public transport. Electric cycles allow older people and people with disabilities to

In Edinburgh a change to 20 mph limits has reduced road traffic casualties by 40%

cycle more easily, especially on hills and for longer distances.

We should harness the health benefits of reduced car travel. Pollution from road traffic contributes to many health conditions: 34% of men and 42% of women are not active enough for good health, and active travel can be one of the best ways of fitting exercise into a busy day.

Let's prioritise our health by making roads safer. We can't afford not to if we want to look after our planet and the coming generations.

Scarlett McNally, professor, Eastbourne
scarlettmcnally@cantab.net
Twitter @scarlettmcnally

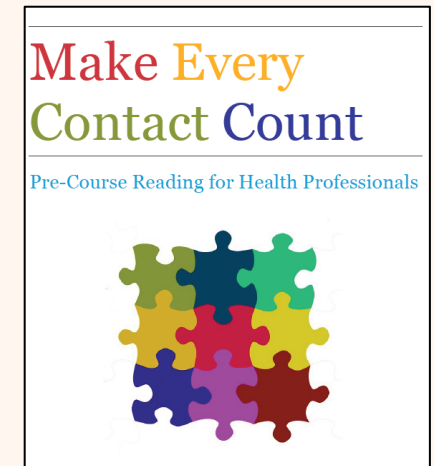
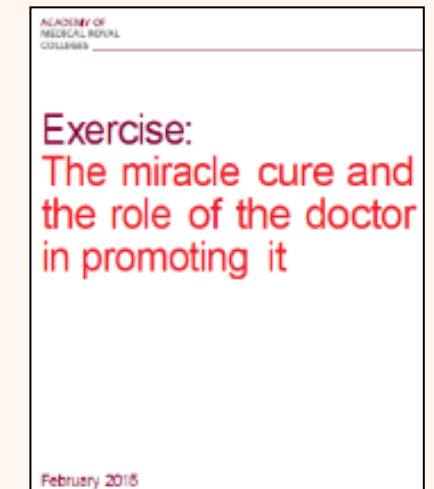
Cite this as: *BMJ* 2022;379:o2862

the **bmj** | 3 December 2022

- BMJ 2022;
<https://doi.org/10.1136/bmj.o2862>

Lots of angles:

- Exercise
- Sustainability
- People empowerment
- Community
- Poverty (car costs)
- Less Pollution
- Fewer Collisions



Papers on www.scarlettmcnally.co.uk

What can you do today?



DRIVERS:

- If you cannot give 1.5 metres (5 feet) **DO NOT OVERTAKE**

CYCLING:

- ride in the centre of the lane in slower-moving traffic and approaching to junctions or road narrowings



What can you do?

- e-cycle loan scheme

Helena McKeown @helenamckeown · 8h
Great idea.
Love my E-bike, saves lots of car journeys @salisburycogs @scarlettmcnally @tsphlthsg @UHD_NHS

SFT Sustainability @SustainableSFT · Nov 7
Loving our new E-bike posters! Thank you @SalisburyNHS Comms team, great job 🙌

We have 5 E-bikes that staff can loan completely FREE of charge for up to 2 weeks to see how they like riding with a little extra oomph!
[Show this thread](#)



Person Centred & Safe Professional Responsive Friendly Progressive

2 2 390

Me

- 2018: Myeloma = cancer of plasma cells in bone marrow
Cardiac amyloidosis = abnormal protein around heart
- 2019: GOT ELECTRIC-BIKE!
- 2020: Stem Cell Transplant
- 2021: Hip replacement



Summary

- Exercise at 150 minutes per week reduces the risk of dementia, diabetes and depression by 30%
- Exercise helps common conditions
- It needs to be in a schedule ACTIVE TRAVEL is best
- We can't afford not to

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www.movingmedicine.ac.uk

