Investment in urban greenways for public health….

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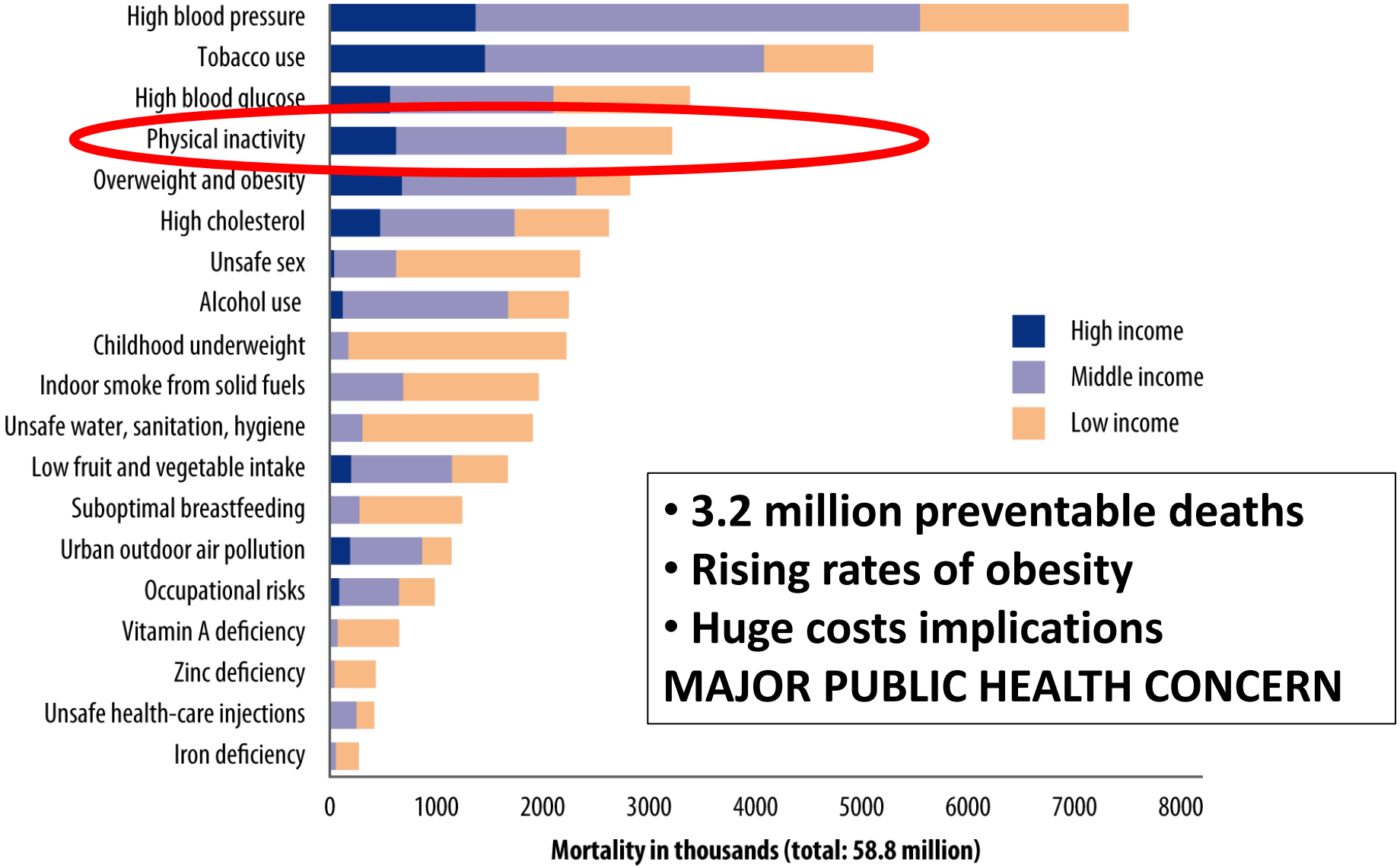
The Problem: Physical Inactivity



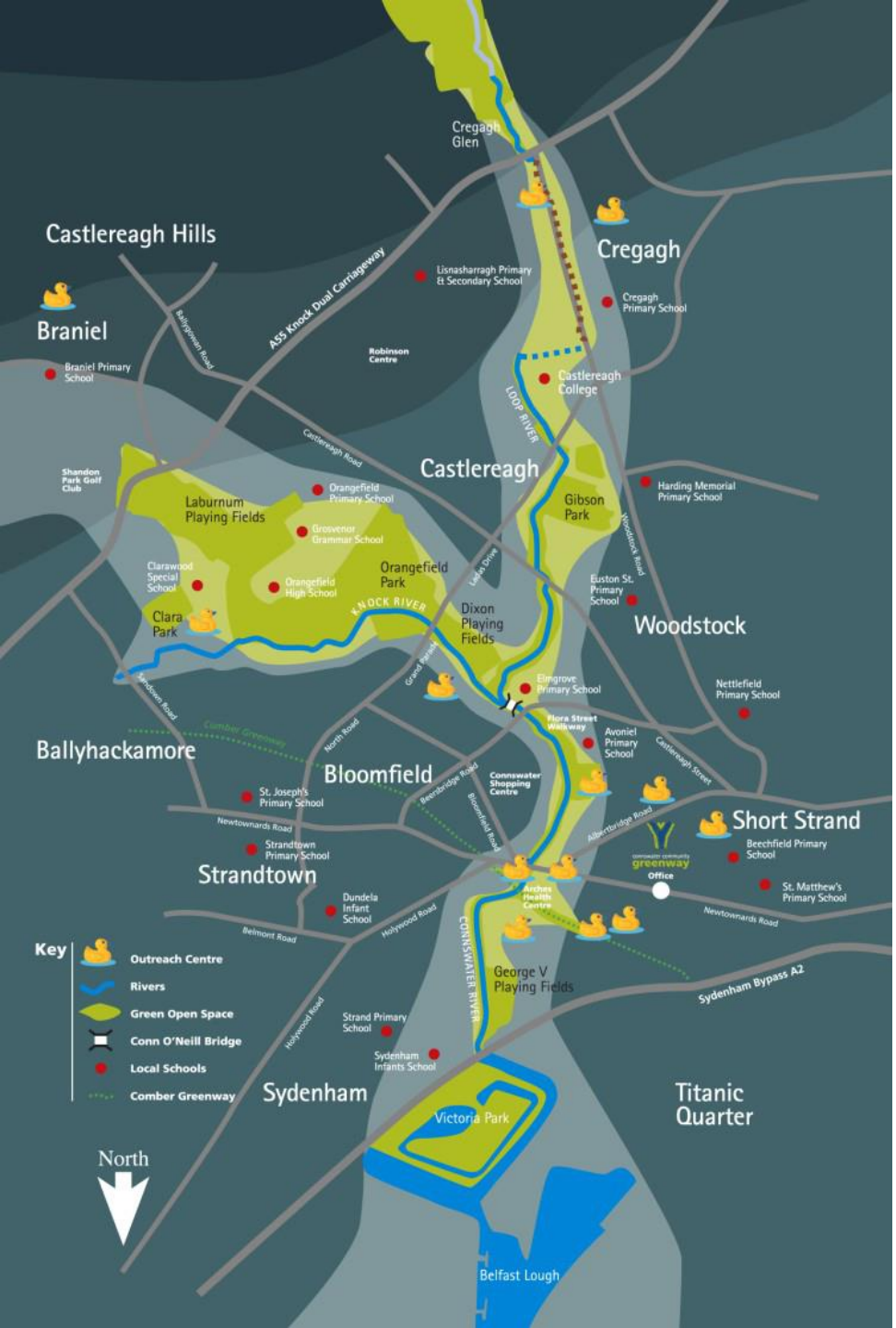
- **3.2 million preventable deaths**
- **Rising rates of obesity**
- **Huge costs implications**

MAJOR PUBLIC HEALTH CONCERN

WHO report, 2004

Built environment & physical activity

- Cross-sectional evidence - Positive/mixed.
- Environmental interventions generally more cost-effective than other prevention programs.
- UK & US government policies recommend improving the built environment to address public health issues.

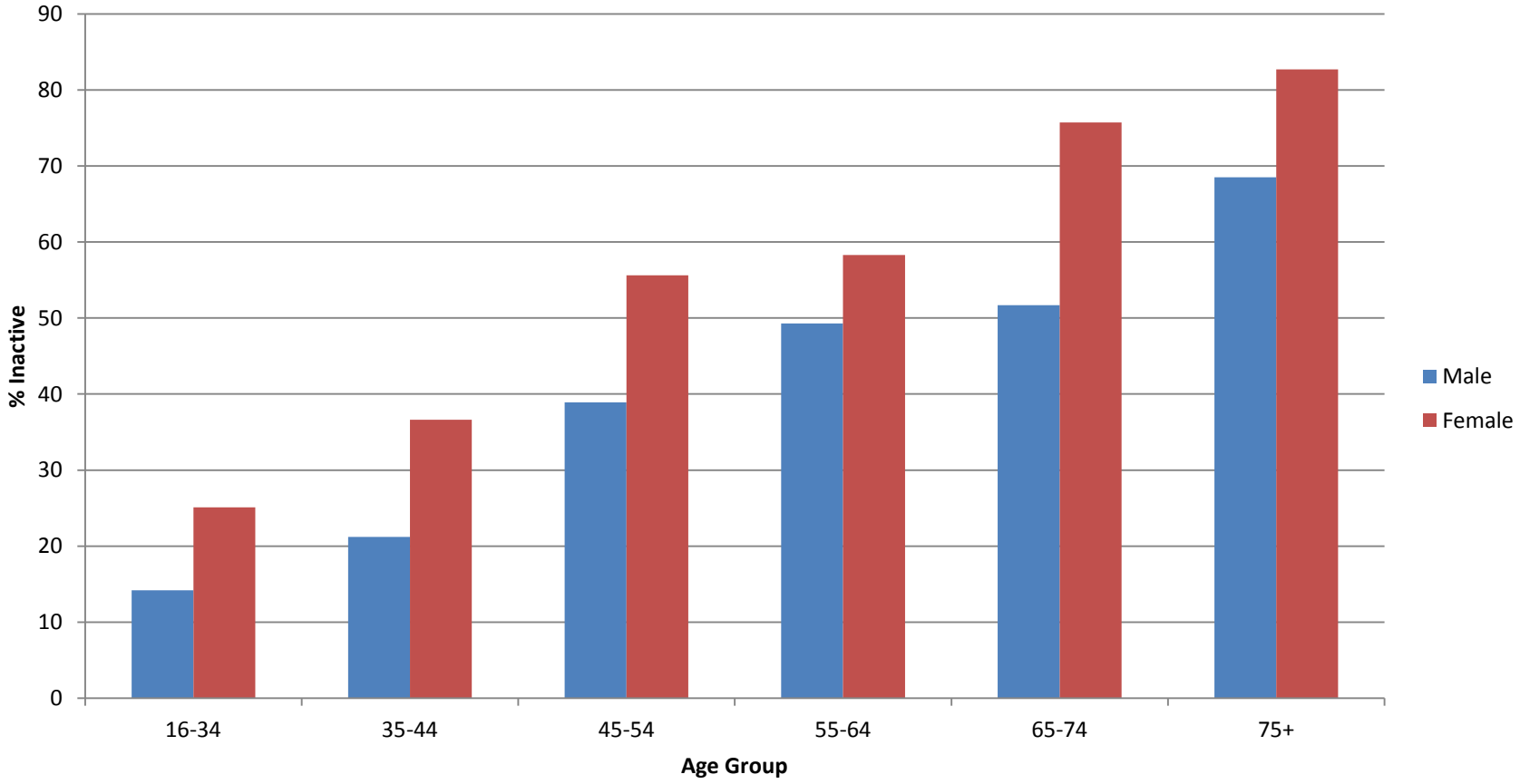


Physical Activity & Rejuvenation of Connswater (PARC) study

- A major environmental improvement project currently underway in East Belfast. (6 years duration)
- Connects 379 acres of public open space by building 43 bridges and 19 kilometres of cycle and walkways.
- Around 100,000 people living adjacent will benefit from a better living environment, opportunities for leisure, exercise, recreation and support for healthier lifestyles.
- Basic study design- quasi-experimental before and after survey including the general physical activity questionnaire (GPAQ).

From PARC questionnaire:

Percentage of people classified as *'inactive'* in the Greenway population



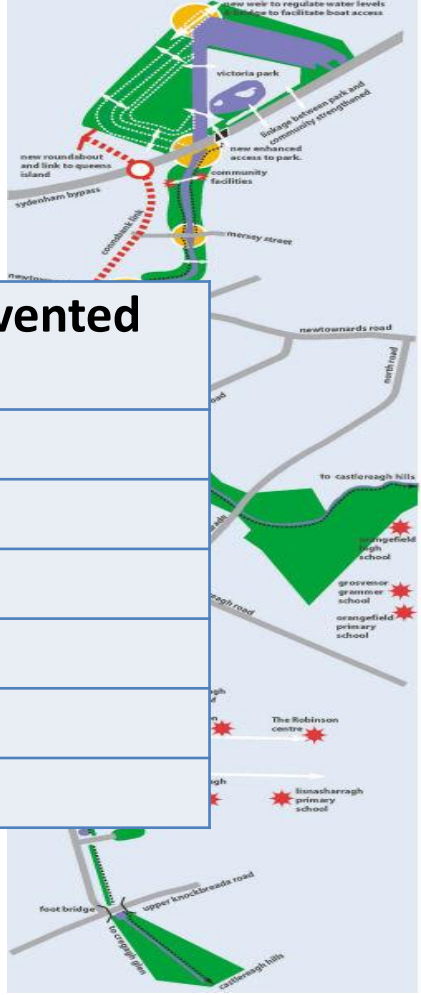
*Inactive= Do not meet the current UK physical activity guidelines of at least 150 minutes of moderate-intensity physical activity per week.

Connswater Community Greenway

Over 40 yrs....

↓

Chronic Diseases	New Cases Prevented	Deaths Prevented
Colon cancer	6	2
Breast cancer	12	0
Ischaemic heart disease	50	5
Type 2 Diabetes	76	0
Stroke	40	10
Total	**184**	**17**



Disability Adjusted Life Years (DALYs)

[Construction & Maintenance costs / DALYs = £18,410/DALY

- Disease cost savings]

COSTS **BENEFITS**

Prevent - Italy

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- Based on: **Potential Impact Fraction (PIF)**
- *It is a measure of the reduction in the proportion of new cases of disease in population after change in risk factor exposure i.e. physical inactivity.*

$$PIF = \frac{(p - p^*)(RR - 1)}{p(RR - 1) + 1}$$

Prevent Plus

Help Specification Run Exit

CCG construction & maintenance costs related to physical activity.

	Siteworks	Footbridges	Walkways	Steps	Lighting
Total	£14,140	£772,750	£3,082,105	£24,000	£1,638,180
Grand Total	**£5,531,175**				

Areas of maintenance	Cost per year	Total cost over 41 years	Total discounted maintenance cost over 41 years
Small Pedestrian footbridges	£41,800	£1,713,800	£934,442
Bark Mulch Path	£7,268 beginning in year 2	£290,736	£155,217
Bark Footpath	£435 for first year and 938 every year after.	£37,935	£20,456
Trim trail inspection & maintenance	£5,000	£205,000	£111,775
Trim trail replacement	£20,000 every 10 years	£80,000	£37,681
Eco Trail replacement	£3,000	£123,000	£67,065
Total		**£2,450,471.48**	**£1,326,636**

Total disease cost savings

	Scenario A- Total cost savings	Discounted	Scenario B- Total cost savings	Discounted	Scenario C- Total cost savings	Discounted
Colon Ca	42,924.81	17,231.16	78,695.49	33,586.28	135,928.57	57,004.44
Breast Ca	107,198.88	41,115.62	178,664.80	73,961.44	330,529.88	135,595.20
IHD	73,956.95	35,498.15	184,892.37	89,621.07	375,701.31	179,476.89
Type 2 diabetes	107,411.68	55,680.42	265,702.57	139,167.03	531,405.15	278,173.48
Stroke	121,931.21	62,285.94	295,683.18	144,842.79	609,656.03	295,838.41
Total	**£453,424**	**£211,811**	**£1,003,638**	**£481,179**	**£1,983,221**	**£946,088**

Incremental Cost-effectiveness Ratio Calculations for Scenarios A,B &C

Scenario (estimate of effect)	Discounted Construction & Maintenance Costs	Discounted Disease Cost Savings	Incremental costs	Total DALYs saved	Total Discounted DALYs saved	£/DALY
A (2%)	£6,857,811	£211,811	£6,646,000	1479.25	361	**£18,410.82**
B (5%)	£6,857,811	£481,179	£6,376,633	2959.24	722	**£8,830.10**
C (10%)	£6,857,811	£946,088	£5,911,723	5420.19	1323	**£4,469.45**

How does the Greenway compare??

- Cost-effectiveness of Statins to prevent heart disease:

  Men: £28,000/QALY

  Women: £57,000/QALY

Greenway £18,410/DALY

V's

BUT……

- Only modelled the impact of the top 5 PA related diseases.

- May have ‘indirect’ health benefits & benefits beyond health.

- Our health impact and cost-effectiveness estimates could be considered underestimates.

Conclusions

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Urban greenways have the potential to increase physical activity levels cost-effectively

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Background: For many, physical activity has been engineered out of daily life, leading to high levels of sedentariness and obesity. Multi-faceted physical activity interventions, combining individual, community and environmental approaches, have the greatest potential to improve public health, but few have been evaluated. **Methods:** Approximately 100 000 people may benefit from improved opportunities for physical activity through an urban regeneration project in Northern Ireland, the Connswater Community Greenway. Using the macro-simulation PREVENT model, we estimated its potential health impacts and cost-effectiveness. To do so, we modelled its potential impact on the burden from cardiovascular disease, namely, ischaemic heart disease, type 2 diabetes mellitus and stroke, and colon and breast cancer, by the year 2050, if feasible increases in physical activity were to be achieved. **Results:** If 10% of those classified as 'inactive' (perform less than 150 minutes of moderate activity/week) became 'active', 886 incident cases (1.2%) and 75 deaths (0.9%) could be prevented with an incremental cost-effectiveness ratio of £4469/disability-adjusted life year. For effectiveness estimates as low as 2%, the intervention would remain cost-effective (£18 411/disability-adjusted life year). Small gains in average life expectancy and disability-adjusted life expectancy could be achieved, and the Greenway population would benefit from 46 less years lived with disability. **Conclusion:** The Greenway intervention could be cost-effective at improving physical activity levels. Although the direct health gains are predicted to be small for any individual, summed over an entire population, they are substantial. In addition, the Greenway is likely to have much wider benefits beyond health.

CCG Return on Investment Study

$$ROI = \frac{(\text{Gain from Investment} - \text{Cost of Investment})}{\text{Cost of Investment}}$$

1. Property Values- QUB planners GIS data & UUJ House price index stats.
2. Flood Alleviation- Rivers Agency
3. Biodiversity- BCC landscaping plans & QUB QUERCUS
4. Tourism/visitors- SUSTRANS intercept surveys & EBP (tourist centre)
5. Labour productivity- EBP(4 & 2 educational officers), BCC (2 wardens), Allied Bakeries, Bombardier, Arches HC & volunteering opportunities.
6. Climate Change- CCG household survey (active travel PA levels).
7. Quality of Place- NINIS crime stats.
8. Health & Wellbeing ☑