

The merits of using Health Impact Assessment in the planning of urban 'car-free-day' interventions – a case study from Cardiff, Wales UK.

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Air pollution is the largest environmental risk to health (WHO, 2016). Public Health Wales (PHW) has estimated that in 2017 the mortality burden range attributable to air pollution (fine particulates and nitrogen dioxide combined) was equivalent to 1,000 to 1,400 deaths in Wales alone. Road traffic is a major source of both pollutants.

One approach trialled by Cardiff Council to reduce air pollution from traffic sources is to make urban streets traffic-free and promote active, sustainable travel. But how can the success of such an intervention be assessed? Could opportunities to reduce air pollution coincide with opportunities to improve health and reduce inequalities? Is there potential for unintended consequences? A Health Impact Assessment (HIA) can help do this in a variety of ways to inform decisions and future actions.

HIA aims to maximise health and wellbeing and to reduce health inequalities. It identifies both positive and negative impacts in context of the wider determinants of health (physical, mental, social and community). It seeks to understand the distribution of impacts upon populations or vulnerable groups and in turn inform decision makers and communities. A HIA comprises of 5 stages (WHIASU, 2012) which are outlined in Table 1.

Table 1: Five key steps of HIA (adapted from WHIASU, 2012)

Stage	Summary of actions required
Screening	Consideration of <ul style="list-style-type: none"> • Relevant local and national policy, • Local environment, • Scale of health impacts (positive or negative), • Broader health determinants • Vulnerable population groups. • Duration of assessment i.e. 'desk-top' (taking hours), rapid (days/weeks) or comprehensive (months/longer). Prospective or retrospective.
Scoping	Establishment of <ul style="list-style-type: none"> • Terms of reference, • Roles and responsibilities, • Methods for collecting evidence • A plan for undertaking the assessment.
Assessment	Appraising evidence by <ul style="list-style-type: none"> • Gathering information on the nature, size, likelihood and distribution of impacts and benefits, particularly for vulnerable groups. • Identifying and suggesting actions to address gaps in the understanding of impacts or missed opportunities to consider health.
Report	<ul style="list-style-type: none"> • Record outcomes • Make recommendations that maximize health and wellbeing, mitigate negative impacts and address gaps in knowledge and inequalities.
Monitoring & Evaluation	<ul style="list-style-type: none"> • Has the HIA informed or influenced decision-making by its target audience to address impacts

Cardiff Car Free Day 1

To test the usefulness of HIA in this context, a retrospective HIA was undertaken of a car-free day held in Cardiff on Thursday, September 22nd 2016. The assessment was undertaken by PHW's Environmental Health Protection team following the process as set out in Table 1 and in accordance with Wales Health Impact Assessment Support Unit guidance (WHIASU, 2012).

Screening identified evidence which supported closing or changing the nature of a street had a range of potential health impacts and unintended consequences for local populations and vulnerable groups. The Healthy Street Indicators (Lucy Saunders, 2018) and used by Transport

for London, were considered useful in broadening the assessment. HIAs require consideration of relevant local and national policies. The impacts, indicators and policies were collated under 'wider health determinant' themes as per WHIASU guidance, to produce a checklist (Table 2).

In **scope**, the assessment aimed to inform the planning of future car-free-days to maximise positive impacts upon health and wellbeing based on learning from the initial one. The **assessment** process used the wider determinants and population groups' checklist contained in the guidance to retrospectively compare which impacts were, or could have been identified as relevant and assessed. The assessment **report** of the first day concluded:

- It was limited in scale but supported policies to promote sustainable travel and pollution reduction.
- No evidence that the public had left their cars at home or used alternative transport.
- Evidence that nitrogen dioxide and particulate matter pollution reduced. However, could not disprove that this due to other factors such as the weather on the day or that emissions displaced elsewhere.
- Was managed by a few local authority officers within existing resources assisted by stakeholders representing the university, bicycle, bus and rail providers.
- Had not considered the other impacts or displacement of impacts.
- Missed opportunities to:
 - Use surveys or interviews with the public and vulnerable groups.
 - Obtain available traffic and bicycle counts, accident data and air quality data.
 - Collate feedback from the Traffic Regulation Order consultation.
 - Engage with other stakeholders and vulnerable group.
 - Collate and evaluate social media content.

The assessment **recommended** that when planning future events:

- Establishment of a steering group coordinated by event organiser
- Early engagement of stakeholders to consider available resources.
- The Traffic Regulation Order (TRO) consultation be extended to identify potentially vulnerable groups - with feedback collated.
- Use of surveys and social media to collate public participation data.
- Consideration of displacement of impacts e.g. along traffic diversion routes.
- Interpretation of air quality data in context of traffic data from nearby roads, the weather and regional pollution levels.
- Monitoring pollution along still open roads.
- Using deprivation indices to understand population health status within and outside road closure.
- Using existing data sources e.g. traffic and bicycle counters, accident statistics, pollution monitoring networks.
- Proportionate selection of impacts i.e. not all need to be assessed.

Cardiff's Car Free Day 2

The HIA assisted in a better understanding the impacts of the initial day and informed the planning of a second car-free-day (Sunday 13th May, 2018) with more extensive road closures, a mass participation bicycling event with family-friendly, on-street entertainment and activities.

Table 2: Assessment checklist (health determinants, impacts, vulnerable groups and relevant policy) derived at the HIA Screening stage

Source: 1 = event aim 2 = WHIASU guidance (2012) 3 = 'Healthy Streets' indicator (Saunders, 2011) 4 = national & local policy (Wales & Cardiff)

Positive Impacts	Source	Negative Impacts	Vulnerable Groups
Lifestyles	2		
Increased physical activity	2	Decreased activity elsewhere	Living in areas exhibiting poor economic health indicators / Living in isolated / over-populated areas People unable to access services, facilities. People with physical or learning disabilities/difficulties Children and young people Older people Students (in this case)
Active travel - did people walk or cycle?	1,3,4	Decreased active travel elsewhere	
Sustainable travel car left at home?	1,2,4	People did not leave cars at home	
People feel relaxed	3	People are not relaxed elsewhere	
Places to stop & rest available	3		
Shade & shelter available	3		
Things to see & do	3		
Social and Community Influences	2		
Reduced isolation	2	Increased isolation	Living in areas exhibiting poor economic or health indicators / Living in isolated/over-populated areas People unable to access services and facilities
Community able to access & participate	2	Reduced access, egress around closure	
Neighbourliness	2	Social isolation due to road closure	
Sense of belonging / community identity	2	Divisions if closure breaks communication	
Mental Wellbeing	2		
Reduced noise	2,3,4	Increased noise elsewhere	Living in areas exhibiting poor economic / health indicators People living in isolated/over-populated areas
Neighbourliness	2	Social isolation	
Access to open space	2	Reduced access elsewhere	
Living & Environmental Conditions	2		
Improved air quality	1,3,4	Pollution displaced elsewhere	Adults and children with lung or heart conditions. General population at Very High levels of air pollution
Reduced noise	2,3,4	Noise displaced elsewhere	Those with cardiovascular effects, sleep disturbance, cognitive development, hearing impairment, annoyance
Attractiveness of area / green space	2	Displaced traffic reduces attractiveness	
Reduced road hazards / accidents	2,3	Increased hazards / accidents	
Community safety	2,3		
Reduced smell/odour from traffic fumes	2	Smell/odour displaced elsewhere	
Waste disposal	2	Difficult to access refuse if road closed	
Quality & safety of play areas	2		Children
Economic Conditions Affecting health	2		
Improved access to shopping & services	2	Reduced access elsewhere	People with physical or learning disabilities/difficulties - Living in areas exhibiting poor economic / health indicators - People living in isolated/over-populated areas - People unable to access services and facilities.
Workplace conditions improved	4	Workplace conditions decline elsewhere	
Access and quality of services	2		
Improved access - medical / caring services	2	Reduced access to area or elsewhere	People with physical or learning disabilities/difficulties Living in areas exhibiting poor economic/ health indicators People living in isolated/over-populated areas People unable to access services and facilities.
Increased access to shops	2	Reduced access to area or elsewhere	
Increased access to and use of public	2	Reduced access to area or elsewhere	
Parking space requirement reduces	2	Reduced access to area or elsewhere	
Macro-economic, Environmental and	2		
Increased commerce	2	Reduced access to area or elsewhere	Local commercial sector
Reduction in climate change emissions	2,4	No benefit if emissions are displaced	Entire population
Improved bio-diversity	2,4	Reduced biodiversity	



A Steering Group was formed to oversee the HIA and delivery process for day 2 and was led by the local authority traffic officer responsible for organising the day along with air quality, noise and media specialists. Other stakeholders included PHW, Cardiff & Vale Local Health Board and an academic researcher. The checklist (Table 2) enabled the group to discuss and agree which impacts could be assessed within available resources. Those impacts chosen and how they benefited from HIA are listed in Table 3.

The HIA provided a structured, flexible, collaborative process that identified impacts, vulnerable population groups and potential unintended negative health consequences not originally considered. The checklist enabled selection of impacts that could be evaluated within available resources. Data were collated via smaller projects e.g. standalone noise, air quality and traffic monitoring. This

shared the 'burden' of actions amongst stakeholders making tasks more manageable.

Figure 2: 'Car Free Day' Event flyer for the second day (Keep Cardiff Tidy)

Conclusion

Car free days could vary in duration, geographical extent and setting, therefore the range impacts identified for assessment in Table 2 could be selected proportionality. Longer term or permanent car-free-street interventions may require comprehensive HIA, building upon these findings.

A car-free-day that successfully reduces pollution within the car-free area along with the proven uptake of sustainable travel by the public would be standalone success. In this case the HIA provided a systematic approach and highlighted opportunities to consider more impacts including whether the intervention had displaced impacts. Based on the impacts assessed, Cardiff's second car-free-day was positive overall. This approach could be used elsewhere.



Photo: Castle Street on second car-free-day (Wales Online)

Table 3: Recommendations and impacts chosen by steering group to be evaluated for the second day.

Recommendation / health impact	Without HIA	With HIA	How enhanced by HIA
Steering Group	No	Yes	Forward planning with more stakeholders and resources enabled more impacts to be
Car free street	Yes	Yes	Considered impacts beyond the car-free street
Sustainable travel promoted	Yes	Yes	Both days supported national & local policy to reduce pollution and to promote sustainable travel.
People left their cars at home	No	Yes	Cross referencing with bus passenger numbers reported by public transport operators
Traffic regulation Order	Yes (limited)	Yes	Consultation broadened to include every property and business within the city centre. Feedback was collated with no negative comments received.
Displacement of impacts	No	Yes	Highway engineer knowledge of where traffic may divert enabled locations where displacement of air quality, noise and traffic counts could be measured.
Air quality	Yes (limited)	Yes	Quality controlled, additional monitoring locations. Comparisons made with days where cars were flowing freely. Reduction in NO ₂ within road closure and still open roads confirmed.
Traffic Counters	No	Yes	Multiple counter locations. Reduced traffic on all roads outside of closure.
Noise	No	Yes	Noise measurements within car-free street only.
City centre footfall	No	Yes	City centre footfall cameras saw increase over equivalent days.
Event participation data provided by bike event organiser	No	Yes	Evidence that event attracted 5,000 people. Car-free-streets cited as one of the main reasons to attend. Many were regular, male cyclists bringing their families.
Social media reporting	No (anecdotal)	Yes	Circa 750 tweets collated but not analysed.

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