

# PhD Research Presentation

## **How are UK Ambulance Services reducing their carbon emissions?**

### **Investigating opportunities for sustainability behaviours within Paramedic and Ambulance Service practice**

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# Phases of Study

PHASE  
1

- **Systematic Literature Review**

- Evidence Base
- Map the territory and identify the gaps

PHASE  
2

- **Semi structured, in depth interviews**

- Purposive sample of strategic managers from 10 NHS Ambulance Trusts in England
- explore current experiences, interventions, attitudes, knowledge and behaviour.

PHASE  
3a

- **Pilot pre-observational ethnographical study of operational ambulance stations,**

- Identify the features, categories and dynamics of what data to collect.
- Construction of an observational template for the full study.

PHASE  
3b

- **Full participative observational study**

- what resources (fuel, energy and utilities) are used and the waste generated / managed during operational activity
- witness the inter-relationships between people as they carry out their daily occupation and explore the attitudes / behaviours of operational staff towards sustainability and meeting the strategic organisational objectives

# Phase 2 -Semi structured, in depth interviews

o Research Question –

‘What are the experiences of Sustainability Development Managers of NHS Ambulance Trusts in England, when implementing carbon reduction strategies?’

# Key Objectives

- o • To identify the nature of sustainability initiatives that are being employed by each Sustainability Manager within NHS Ambulance Service Trusts in England to meet carbon emission reduction targets.
- o • To explore how confident Sustainability Managers are with their impact and overall measurement of the initiatives, in order to evidence carbon emission reduction.
- o • To explore what Sustainability Managers' personal, longer term priorities, aspirations and strategic impetus are, towards meeting carbon reduction targets.
- o • To understand how Sustainability Managers view the level of other employee engagement with strategic objectives within the SDMP (from a strategic viewpoint).

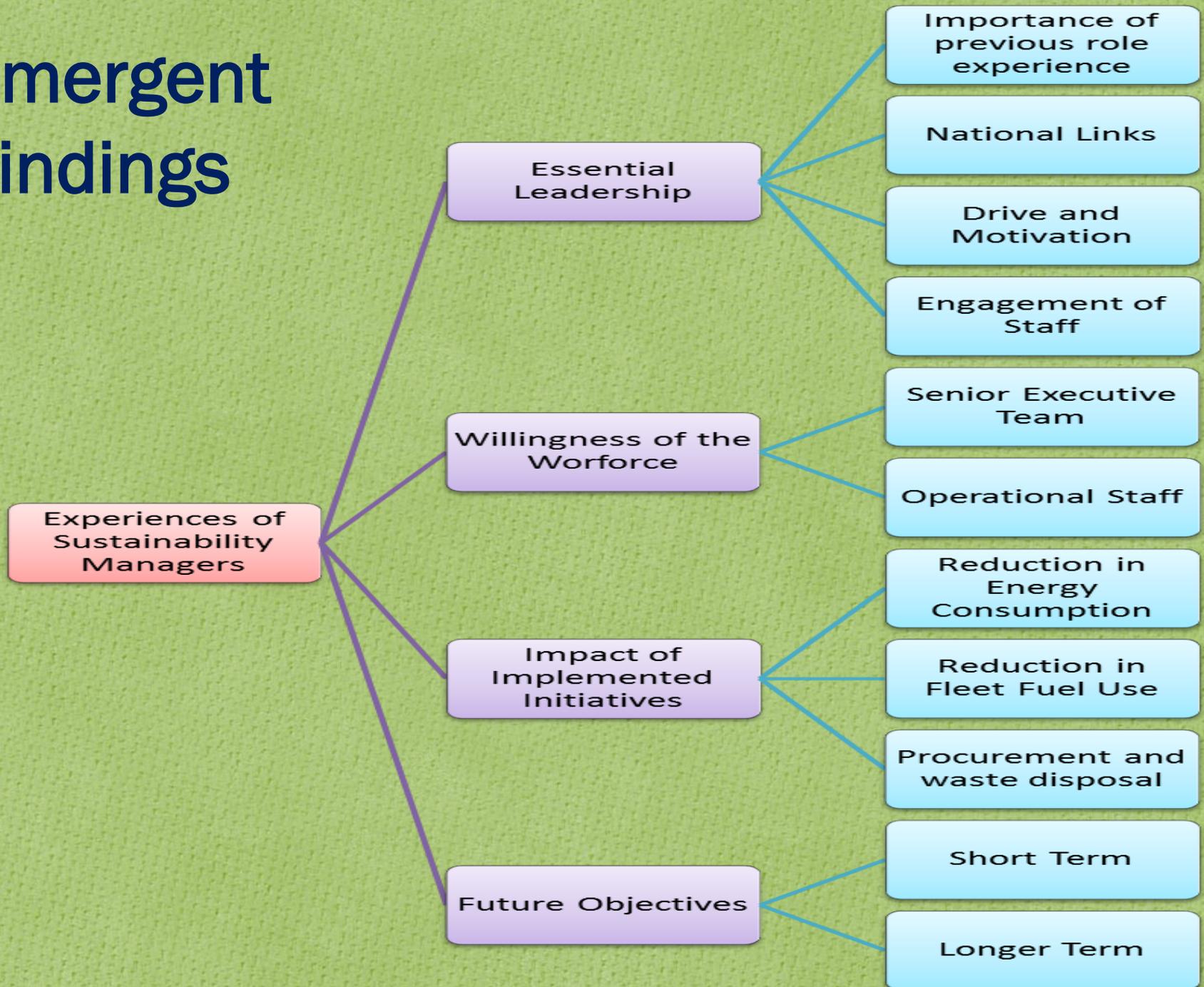
# Methodological Approach

- Qualitative design - naturalism orientation with an interpretive approach has been adopted, to understand the participants' interpretations of the 'real' world
- Phenomenological paradigm (the lived experience)
- 'Lebenswelt' or lifeworld approach
- Requires an approach of openness and willingness to see the data 'talk for itself' and allow it to be interpreted in innovative ways

# Methods

- o Purposive sample (strategic sustainability manager from each of the 10 NHS Ambulance Trusts in England)
- o Semi structured qualitative interviews
- o Ethical Approval (PU and R&D)
- o Audio recorded and transcribed
- o Raw data reduced, categorized and coded, identifying any patterns or themes that emerge - Seven Step Process of Thematic Analysis (Braun and Clarke, 2013:201)
- o Reflexivity
- o Rigour - credibility, dependability, transferability, confirmability and authenticity.

# Emergent Findings



# Essential Leadership

- o Importance of previous role experience
- o Drive and motivation
- o Creating and maintaining National Links
- o Engagement of staff



(Greenbiz, 2016)

## Essential Leadership – Importance of previous role experience

“Prior to me turning up....no one had done the role. There was an environmental working group, however...nothing really ever was actually achieved. That is probably a dreadful thing to say, but I don't think it really was. It was just a talking shop...realistically, no one had ever had the time....it wasn't anyone's job to do, basically. When I came in, we started to review the carbon footprint, find out what our baseline was and I suggested we went through the carbon trust's carbon management programme, which I had done previously [with another emergency service] and was really successful.

(Interview 1)

“I came in and the guy who'd been in beforehand who had been doing the full Carbon Trust Programme. He took eight months to not assemble anything at all. He'd written nothing of a report. I came in the beginning of December, had to have the report finished by the beginning of January... so in the space of a month I'd done the sort of thing which he hadn't managed to do in a year.

(Interview 4)

## Essential Leadership – Drive and motivation

“The only bad thing about my role is that a lot of places that have a Sustainability Manager or an Energy Manager has a single stand-alone role... where at the moment I’m doing a dual role. I’ve got Estate Management responsibility for [portion of Trust area] but then I’ve got a sustainability role which covers the whole Trust and obviously the frustration for me is getting that balance right because it predominantly seems to be Estate Management with the energy and sustainability as and when I can fit it in really.... which doesn’t seem right to me. Yeah, if I could get enough time to spend more on the sustainability I’m sure I’d be able to save a lot more money and a lot more energy .... I’d focus a lot more on that.”

(Interview 3)

“The NHS can be very bureaucratic and that’s one of the major challenges of getting anything done is that everything has to be signed off at every single bloody level [sighs] but in some ways that’s creates another element of the, the challenge which I think is great .”

(Interview 4)

## Essential Leadership – Creating and maintaining National links

“I found having that networking with other ambulance services, with people doing similar job roles, really helps to benefit you and keep you motivated because it can be a very, very lonely job, being a sustainability person..... because you don't have anybody else [within the trust]”

(Interview 4)

“Because we're scattered right across the country it's difficult to get the time for [network meetings] though. But we email each other regularly with initiatives with going on...update each other with what each Trust is doing”

(Interview 3)

Without collaborating with others, I don't think that you'll get really far. You know, for kind of finding out what works and what doesn't. Also it's much easier....I think a lot of environmental managers like me feel that you actually work in a silo and actually having network groups makes you feel that you work in a broader environmental team....and almost lightens the load I think. Its imperative to make sure that you don't think that you are going insane [laughs]

(Interview 1)

# Essential Leadership – Engagement of staff

“[Sustainability] has to be something that’s incorporated within an Organisation, really, for it to actually um ....actually make a difference.

(Interview 4)

“We’ve kind of shamed people into doing [disposal of waste] the right way. That was partly a cost issue....I just don’t think they [operational staff] even had a clue as to how much it cost to get rid of clinical waste...and when you told them...they looked in absolute horror, especially for sharps, that’s phenomenal. So that really hammered the point home,”

(Interview 1)

“...even telling them how much we spend on diesel to power the vehicles, they are kind of....absolutely horrified that we spend nearly £5 million pounds a year on diesel. I just don’t think it hits home what the costs to the organisation are away from the clinical side...and what it does cost to keep the organisation going.

(Interview 1)

# Willingness of the Workforce

- o Senior Executive Team
- o Operational staff



(The Herald , 2015)

## Willingness of the Workforce– Senior Executive Team

“Actually I don’t think it’s the board that are necessarily the issue...I think it’s the wider workforce...and how our workforce are geographically distributed....and quite difficult to communicate with. It’s often one of our issues rather than it being that there’s no ‘buy-in’ from board....because I think that we have huge ‘buy-in’ from the board.

(Interview 1)

“Green issues aren’t high up on the agenda when you’ve got patient care to gun for. The knock on effect would benefit patient care but the investment needs to be done in the first place and it needs to be seen as a benefit rather than “Oh god, I’ve got to do green stuff again”

(Interview 4)

## Willingness of the Workforce– Operational staff

“I think because of morale at the coal face is quite low.....it depends who you speak to...we have quite a big divide in our organisation between north and south. The north tend to be far more progressive thinking.”

(Interview 1)

“It is actually really difficult to create incentives...other than ‘you will have a really nice warm feeling if you help your trust’...and this is what we are aiming for...I was really quite surprised by the lack of response [in recruiting environmental champions] whereas I thought I would get more. We have got some really keen individuals, but as a whole they are not as engaged.....and I didn’t expect that really.”

(Interview 1)

# Impact of Initiatives

- o Reduction in energy consumption
- o Reduction in Fleet Fuel use
- o Procurement and waste disposal



(Dealcloserblog, 2014)

## Impact of Initiatives– Reduction in energy consumption

“We’ve turned all the heating off in our garage areas, because we were heating garages and it was ridiculous as there was no one ever in them, except when they got out of the vehicle into the accommodation area. That was a huge saving.”

(Interview 1)

“You go into an ambulance station at 2 o’clock in the afternoon and no one would be there...the heating would be on at 26 degrees and the windows would be open. You wouldn’t do it at home....so why would you do it at work? So essentially we have been taking the control of the heating off our staff and making sure it’s just set up to be actually quite a nice temperature.”

(Interview 1)

## Impact of Initiatives– Reduction in Fleet Fuel use

“The problem being that the [available data] didn’t account for ambulances because it was either small vehicles or HG Vehicles and most of our ambulances are in the ‘in between’ bit and ...there’s nothing that’s out there for commercial vehicles ...and commercial vehicles do not report their carbon output at all. It’s only just starting to come in now seven years later so.... the detail’s not been there as to what the fuel consumption reality was.”

(Interview 4)

“Fleet is 75% of our carbon footprint as a Trust. But the investor save projects that you can roll out are just not quite as easy as they are for those with Estates. You can’t just stick a solar panel on a vehicle....you can do that on one building and it makes a massive impact, but it’s not quite the same with Fleet.”

(Interview 1)

## Impact of Initiatives– Procurement and waste disposal

“...it’s very difficult when your front line staff [are] driving out on the road and you’ve got somebody bleeding all over the place. Do they say “Oh I’m going to have to slip this glove off” you’re then going to put it in the same location. You’re not going to say “I’m going to put it in this bin, and this bin, and this bin, oh yes and I’ll put it in that bin.” At one point they were talking about having six different bins on an ambulance. Where’s the space for that?”

(Interview 4)

“You have to understand the constraints that they [operational ambulance staff] work through, so even if you see there’s some recycling materials in general waste you should understand that it’s because of the conditions they work under.”

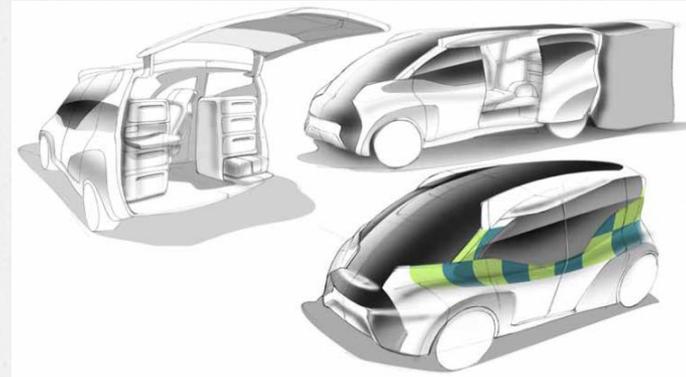
(Interview 2)

“...our assumption was that Paramedics knew how to dispose of their clinical waste. But it turns out that they didn’t.....and we’ve really had to go back to basics about how we dispose and why we are doing it in a certain way.”

(Interview 1)

# Future Objectives

- o Short term
- o Long term



(Baker et al, 2013)

## Future Objectives – Short term

“My main goal for 2016 is to get the Good Corporate Citizen Tool underway. We’ve tinkered with it in the past but we’ve not been in a position to really get to grips with it. But I think now we are in a position to kind of move on with some of those top procurements....we are not great on [sustainable] procurements. I think some of those objectives within the GCC will really help us go forward....and I think that’s really where we need to go in 2016 really”

(Interview 1)

I’m getting electric vehicles in a variety of different sorts of hybrid...which I’m hoping once I’ve got that kind of infrastructure that goes with it in place...So I’m looking at the infrastructure of how we do that for our own vehicles but also how we get the infrastructure in place for lease vehicles, ....for anybody who’s using a private vehicle... just to kind of get the motion going for them.”

(Interview 4)

## Future Objectives – Long term

“I’m also looking at what we need to do to reduce our carbon footprint further ...so what are the technologies I need to put together for next years?”

(Interview 4)

# Some take home Messages

- Sustainability measures help to reduce carbon emissions, helps drive cost efficiency and promotes better healthcare for our patients and ourselves – Ambulance Services have a big part to play in this!
- Its not all about top down decisions....
- What operational staff do can make a real difference. It's the collective that counts

**I think the take-home message ... is anything is better than nothing, a little more is probably better.**

Edward McAuley

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## Potential for the Future Phase 3?

- o Ethnographical (observational) study within the operational strata of EMS delivery.
- o Identifying the connection / disconnection of strategic aims with workforce adoption.
- o Compliance with initiatives?
- o Attitudes and behaviours towards sustainability and initiatives? (contextual variances?)
- o Peripatetic - Fuel use; driving habits; equipment use/ waste generation / segregation / RRR adoption
- o Static - energy / utility consumption; waste generation / segregation / RRR adoption

**Thank You!**

**Any Questions or Comments?**



# References

ALESSANDRINI, E., ZAULI SAJANI, S., SCOTTO, F., MIGLIO, R., MARCHESI, S. & LAURIOLA, P. 2011. Emergency ambulance dispatches and apparent temperature: a time series analysis in Emilia-Romagna, Italy. *Environ Res*, 111, 1192-200.

ATKIN, E. 2015. *These New Quotes From Pope Francis Could Change The Debate On Climate Change* [Online]. Climate Progress. Available: <http://thinkprogress.org/climate/2015/06/16/3670139/encyclical-listicle-aka-the-encyclical/> [Accessed 28/08/15 2015].

**Baker W, Mansfield N, Storer I, Higgett S.(2013) Future electric vehicles for ambulances (FEVA). *Journal of Paramedic Practice*; 5(2): 77-82**

BANK OF ENGLAND. 2015. *Breaking the tragedy of the horizon - climate change and financial stability - speech by Mark Carney* [Online]. Available: <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx> [Accessed 25th October 2015].

BASSIL, K. L., COLE, D. C., MOINEDDIN, R., LOU, W., CRAIG, A. M., SCHWARTZ, B. & REA, E. 2011. The relationship between temperature and ambulance response calls for heat-related illness in Toronto, Ontario, 2005. *Journal Of Epidemiology And Community Health*, 65, 829-831.

BLANCHARD, I. E. & BROWN, L. H. 2011. Carbon footprinting of North American emergency medical services systems. *Prehospital Emergency Care: Official Journal Of The National Association Of EMS Physicians And The National Association Of State EMS Directors*, 15, 23-29.

BBC. 2015a. *Bank of England's Carney warns of climate change risk* [Online]. Available: <http://www.bbc.co.uk/news/business-34396961> [Accessed 05/10/15 2015].

BBC. 2015b. *Obama pleads for Paris climate change deal* [Online]. Available: <http://www.bbc.co.uk/news/world-us-canada-34111860> [Accessed 01/09/15 2015].

BROWN, L. H., BUETTNER, P. G., CANYON, D. V., MAC CRAWFORD, J. & JUDD, J. 2012a. Estimating the life cycle greenhouse gas emissions of Australian ambulance services. *Journal of Cleaner Production*, 37, 135-141.

BROWN, L. H., CANYON, D. V., BUETTNER, P. G., CRAWFORD, J. M. & JUDD, J. 2012b. The carbon footprint of Australian ambulance operations. *Emergency Medicine Australasia*, 24, 657-662.

# References

BUSTINZA, R., LABEL, G., GOSSELIN, P., BELANGER, D. & CHEBANA, F. 2013. Health impacts of the July 2010 heat wave in Quebec, Canada. *BMC Public Health*, 13, 56.

CUSACK, L., DE CRESPIGNY, C. & ATHANASOS, P. 2011. Heatwaves and their impact on people with alcohol, drug and mental health conditions: a discussion paper on clinical practice considerations. *Journal Of Advanced Nursing*, 67, 915-922.

Dealcloserblog (2014) M&A Boutiques vs Banks: Who Will be on Top? Available at <http://blogs.intralinks.com/dealcloser/2014/04/ma-boutiques-vs-banks-will-top/> (Accessed on 19/06/16)

HARTZ, D. A., BRAZEL, A. J. & GOLDEN, J. S. 2013. A comparative climate analysis of heat-related emergency 911 dispatches: Chicago, Illinois and Phoenix, Arizona USA 2003 to 2006. *Int J Biometeorol*, 57, 669-78.

Green Environmental Ambulance Network (2012) United Kingdom of Great Britain and Northern Ireland – Green Passport. Available at: [http://www.swast.nhs.uk/Downloads/SWASFT%20EMG/Green\\_Passport\\_SWASFT.pdf](http://www.swast.nhs.uk/Downloads/SWASFT%20EMG/Green_Passport_SWASFT.pdf) (Accessed on 21/12/13)

Great Britain. Department of Health (2010) Equity and excellence: Liberating the NHS. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/213823/dh\\_117794.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213823/dh_117794.pdf) (accessed on 21/12/13)

Great Britain. HM Government (2013) The National Adaptation Programme Making the country resilient to a changing climate. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/209866/pb13942-nap-20130701.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/209866/pb13942-nap-20130701.pdf) (accessed on 29/12/13)

Greenbiz (2016) 9 skills for success in corporate sustainability leadership. Available at <https://www.greenbiz.com/blog/2012/07/16/9-skills-success-corporate-sustainability-leadership> (accessed on 19/06/16)

Health Business (2015) Ambulance services unite in carbon reduction. Available at: <http://www.healthbusinessuk.net/features/141-sp-145/3318-ambulance-services-unite-in-carbon-reduction> (Accessed on 26/10/15)

HESS, J., HEILPERN, K., DAVIS, T. & FRUMKIN, H. 2009. Climate change and emergency medicine: impacts and opportunities. *Academic Emergency Medicine: Official Journal Of The Society For Academic Emergency Medicine*, 16, 782-794.

KIM, Y., KIM, H., SHIN, S.-D. & HONG, Y.-C. 2012. Different influence of outdoor temperature on traumatic and nontraumatic injuries. *The Journal Of Trauma And Acute Care Surgery*, 73, 944-949.

# References

KNOWLTON, K., ROTKIN-ELLMAN, M., KING, G., MARGOLIS, H. G., SMITH, D., SOLOMON, G., TRENT, R. & ENGLISH, P. 2009. The 2006 California heat wave: impacts on hospitalizations and emergency department visits. *Environ Health Perspect*, 117, 61-7.

KRAVCHENKO, J., ABERNETHY, A. P., FAWZY, M. & LYERLY, H. K. 2013. Minimization of Heatwave Morbidity and Mortality. *American Journal of Preventive Medicine*, 44, 274-282.

KUE, R. C. & DYER, K. S. 2013. The impact of heat waves on transport volumes in an urban emergency medical services system: a retrospective review. *Prehosp Disaster Med*, 28, 610-5.

LINARES, C. & DIAZ, J. 2008. Impact of high temperatures on hospital admissions: comparative analysis with previous studies about mortality (Madrid). *Eur J Public Health*, 18, 317-22

Mail Online (2011) 'The supersize epidemic: EVERY ambulance service in country forced to buy special kit to deal with obesity crisis' Image available at: <http://www.dailymail.co.uk/health/article-1353148/Every-UK-ambulance-service-forced-buy-special-kit-deal-obesity-crisis.html#ixzz403Dv82xM> (Accessed 13/02/16)

MAYNER, L., ARBON, P. & USHER, K. 2010. Emergency department patient presentations during the 2009 heatwaves in Adelaide. *Collegian*, 17, 175-82.

Naylor, C and Appleby, J (2012a) Environmentally sustainable health and social care: Scoping review. Final report. NIHR Service Delivery and Organisation programme. Available at [http://www.nets.nihr.ac.uk/\\_\\_data/assets/pdf\\_file/0003/64551/FR-10-1008-18.pdf](http://www.nets.nihr.ac.uk/__data/assets/pdf_file/0003/64551/FR-10-1008-18.pdf) (accessed on 29/12/13)

Naylor, C and Appleby, J (2012b) Sustainable health and social care: Connecting environmental and financial performance. Available at [http://www.kingsfund.org.uk/sites/files/kf/field/field\\_publication\\_file/sustainable-health-social-care-appleby-naylor-mar2012.pdf](http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/sustainable-health-social-care-appleby-naylor-mar2012.pdf) (accessed on 29/12/13)

SCHMIER, J. K. & EBI, K. L. 2009. The impact of climate change and aeroallergens on children's health. *Allergy Asthma Proc*, 30, 229-37.

Sustainable Development Unit (2009) Saving Carbon, Improving Health – NHS Carbon Reduction Strategy for England. Available at: [http://www.sduhealth.org.uk/documents/publications/1237308334\\_qyIG\\_saving\\_carbon,\\_improving\\_health\\_nhs\\_carbon\\_reducti.pdf](http://www.sduhealth.org.uk/documents/publications/1237308334_qyIG_saving_carbon,_improving_health_nhs_carbon_reducti.pdf) (Accessed on 21/12/12)

# References

Sustainable Development Unit (2013a) Carbon Footprint update for NHS in England 2012. Available at: [http://www.sduhealth.org.uk/documents/Carbon\\_Footprint\\_summary\\_NHS\\_update\\_2013.pdf](http://www.sduhealth.org.uk/documents/Carbon_Footprint_summary_NHS_update_2013.pdf) (accessed on 21/12/13)

Sustainable Development Unit (2013b) Summary of Governance on sustainability. Available at: [http://www.sduhealth.org.uk/documents/publications/SDMP\\_Guidance\\_summ\\_v5\\_sep2013.pdf](http://www.sduhealth.org.uk/documents/publications/SDMP_Guidance_summ_v5_sep2013.pdf) (accessed on 21/12/13)

Sustainable Development Unit (2016) 'Examples of SDMPs' Image available at: <http://www.sduhealth.org.uk/delivery/plan/sdmp-examples.aspx> (accessed 13/02/16)

The Herald (2015) High-drama as Herald reporter spends the day with two Plymouth paramedics. Available at <http://www.plymouthherald.co.uk/video-high-drama-herald-reporter-spends-day/story-28347009-detail/story.html> Accessed on 19/06/16)

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THORNES, J. E., FISHER, P. A., RAYMENT-BISHOP, T. & SMITH, C. 2014. Ambulance call-outs and response times in Birmingham and the impact of extreme weather and climate change. *Emergency Medicine Journal: EMJ*, 31, 220-228.

TONG, S., WANG, X. Y. & GUO, Y. 2012. Assessing the short-term effects of heatwaves on mortality and morbidity in Brisbane, Australia: comparison of case-crossover and time series analyses. *Plos One*, 7, e37500-e37500.

TURNER, L. R., CONNELL, D. & TONG, S. 2013. The effect of heat waves on ambulance attendances in Brisbane, Australia. *Prehospital And Disaster Medicine*, 28, 482-487.

VIDAL, J. 2015. *Arnold Schwarzenegger: climate change is not science fiction* [Online]. The Guardian. Available: [http://www.theguardian.com/environment/2015/jul/21/arnold-schwarzenegger-climate-change-is-not-science-fiction?CMP=fb\\_gu](http://www.theguardian.com/environment/2015/jul/21/arnold-schwarzenegger-climate-change-is-not-science-fiction?CMP=fb_gu) [Accessed 28/08/15 2015].

WILLIAMS, S., NITSCHKE, M., SULLIVAN, T., TUCKER, G. R., WEINSTEIN, P., PISANIELLO, D. L., PARTON, K. A. & BI, P. 2012a. Heat and health in Adelaide, South Australia: assessment of heat thresholds and temperature relationships. *The Science Of The Total Environment*, 414, 126-133.

WILLIAMS, S., NITSCHKE, M., WEINSTEIN, P., PISANIELLO, D. L., PARTON, K. A. & BI, P. 2012b. The impact of summer temperatures and heatwaves on mortality and morbidity in Perth, Australia 1994-2008. *Environ Int*, 40, 33-8.

Williamson, K. (2011) Fuel cell auxiliary power proving efficient for Yorkshire emergency response vehicles. *Fuel Cells Bulletin*: 10; p.12-14

ZANDER, A., NIGGEBRUGGE, A., PENCHEON, D. & LYRATZOPOULOS, G. 2011. Changes in travel-related carbon emissions associated with modernization of services for patients with acute myocardial infarction: a case study. *Journal Of Public Health (Oxford, England)*, 33, 272-279.

# Bibliography

- o Barr, S. Ford, N. J. and Gilg, A.W. (2010) Attitudes towards recycling household waste in Exeter, Devon: Quantitative and Qualitative Approaches. *Local Environment: The International Journal of Justice and Sustainability*: 8; 4; p. 407-421
- o Committee on Climate Change (no date) The Climate Change Act and UK regulations. Available at <http://www.theccc.org.uk/tackling-climate-change/the-legal-landscape/global-action-on-climate-change/> (accessed on 21/12/13)
- o Denscombe, M. (2010) *The Good Research Guide 4th Edition*. Maidenhead: Open University Press
- o Elgitait, Y., Sarshar, M. & Gee, I. (2009) 'Determining the Best Practice in Clinical Waste Management', BEAN Conference 2009, BEST Research Centre (Built Environment & Sustainable Technologies), Liverpool John Moores University, UK. Available at: [http://www.ljmu.ac.uk/BLT/BUE\\_Docs/Elgitait\\_Y\\_GH.pdf](http://www.ljmu.ac.uk/BLT/BUE_Docs/Elgitait_Y_GH.pdf) (accessed on 22/12/13)
- o Elkington, J., (1998), 'Cannibals with Forks: The Triple Bottom Line of the 21st Century Business', New Society Publishers.
- o Fornara, F., Carrus, G. Passafaro, P. and Bonnes, M. (2011) Distinguishing the sources of normative influence on pro-environmental behaviours: the role of local norms in household waste recycling, *Group processes and intergroup relations*: 14:p. 623-635
- o Foundation Trust Network - NHS Confederation (2010) Making sustainability add up. Available at [http://www.sduhealth.org.uk/documents/publications/Making\\_sustainability\\_add\\_%20up.pdf](http://www.sduhealth.org.uk/documents/publications/Making_sustainability_add_%20up.pdf) (Accessed on 21/11/13)
- o Great Britain. Climate Change Act 2008: Elizabeth II. Chapter 27. London: The Stationary Office
- o . Great Britain. Department for Environment Food and Rural Affairs (DEFRA) (2007) 2007 Survey of Public Attitudes and Behaviours toward the Environment. Available at: <http://archive.defra.gov.uk/evidence/statistics/environment/pubatt/download/pubattsum2007.pdf> (Accessed on 21/11/13)
- o Great Britain. Department for Environment Food and Rural Affairs (DEFRA) (2013) Forecasting 2020 Waste Arisings and Treatment Capacity. Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/251567/pb13883-forecasting-2020-waste-arisings-131017.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/251567/pb13883-forecasting-2020-waste-arisings-131017.pdf) (Accessed on 02/01/14)

# Bibliography

- o Holloway, I and Wheeler, S (2002) Qualitative research for Nurses. 2nd Edition. Oxford: Blackwell Science Limited
- o Institute for Sustainability Solutions (2012) Win Win: Saving Cost and Carbon – Sustainable Waste Management in Healthcare. Available at: [http://www.plymouth.ac.uk/files/extranet/docs/FoE/ISSR%20Full\\_FinalReport\\_April%2012\\_\(Full\).pdf](http://www.plymouth.ac.uk/files/extranet/docs/FoE/ISSR%20Full_FinalReport_April%2012_(Full).pdf) (Accessed on 30/12/13)
- o Khan, K, S., Kunz, R., Kleijnen, J. and Antes, G. (2003) Five Steps to Conducting a Literature Review. Journal of the Royal Society of Medicine: 96: p.118-121
- o Lawrence, T. B., Suddaby, R. and Leca, B. (2011). 'Institutional work: refocusing institutional studies of organization'. Journal of Management Inquiry: 20; p. 52–58.
- o Manzi, S., Nichols, A., Pahl, S., Grose, J., Bennallick, M., & Richardson, J. (2012). 'Towards sustainable waste management: An observational study of health care practice'. In E. Gidarakos, R. Cossu & R. Stegmann (Eds.), 3rd International Conference on Industrial and Hazardous Waste Management: Proceedings of an international conference held in Chania, Crete, 12-14 September 2012. Crete, Greece: Technical University of Crete.
- o Manzi S, Nichols A, Pahl S, Richardson J, Bennallick M & Grose J (2013) 'How do they manage it? An observational study of health and social care waste management' PSYCHOLOGY & HEALTH 28, pp 262 - 262
- o McCann, L. Granter, E. Hyde, P and Hassard, J (2013) 'Still Blue-Collar after all these Years? An Ethnography of the Professionalization of Emergency Ambulance Work'. Journal of Management Studies: 50: 5, p 750–776

# Bibliography

- o Nichols, A., Bennallick, M., Manzi, S., Grose, J., Pahl, S., & Richardson, J. (2012). Sustainable healthcare waste management: Ethical, legal and practical challenges. In E. Gidakos, R. Cossu & R. Stegmann (Eds.), 3rd International Conference on Industrial and Hazardous Waste Management: Proceedings of an international conference held in Chania, Crete, 12-14 September 2012. Crete, Greece: Technical University of Crete.
- o Nichols, A. Grose, J. Bennallick, M. and Richardson, J. (2013) Sustainable healthcare waste management: a qualitative investigation of its feasibility within a county in the south west of England. Journal of Infection Prevention: 14 p 60-64,
- o North West Ambulance Service NHS Trust (NFAST) (2013) Estates Strategy 2013/14 - 2017/18. Available at: [http://www.nwas.nhs.uk/media/78619/estates\\_strategy\\_2013-2018\\_v\\_1\\_0.pdf](http://www.nwas.nhs.uk/media/78619/estates_strategy_2013-2018_v_1_0.pdf) (accessed on 21/12/13)
- o Quinn, L and Baltes, J (2007) Leadership and the Triple Bottom Line: A CCL Research White Paper. Available at: <http://www.ccl.org/leadership/pdf/research/tripleBottomLine.pdf> (accessed on 21/12/13)
- o Roetman, P, E, J and Daniels, C, B (Eds) (2011) Creating Sustainable Communities in a changing world. Adelaide: Crawford House Press
- o Rogerson, R., Bellingham, R. And Shevtsova, Y. (no date) Available at: [http://www.detini.gov.uk/changing\\_behaviour\\_and\\_attitudes\\_to\\_sustainability\\_\\_a\\_report\\_for\\_the\\_department\\_of\\_enterprise\\_\\_trade\\_and\\_investment.pdf](http://www.detini.gov.uk/changing_behaviour_and_attitudes_to_sustainability__a_report_for_the_department_of_enterprise__trade_and_investment.pdf) (accessed on 30/12/13)

# Bibliography

- o Semenza, J, C (2012) Book Review: Creating Sustainable Communities: The Quadruple Bottom Line. EcoHealth: 9 (p.499-501)
- o South Central Ambulance Service NHS Foundation Trust (2013) Sustainable Development Management Plan 2013/14 to 2015/16. Available at [http://www.southcentralambulance.nhs.uk/\\_assets/documents/sustainable%20development/sdmp%20final.pdf](http://www.southcentralambulance.nhs.uk/_assets/documents/sustainable%20development/sdmp%20final.pdf) (accessed on 29/12/13)
- o South Western Ambulance Service NHS Trust (SWAST) (2010) Estates and Facilities Strategy 2010 to 2016. Available at:
- o South Western Ambulance Service NHS Foundation Trust (SWASfT) (2012) Strategic Plan Document for 2013-2014. Available at: [http://www.swast.nhs.uk/Downloads/SWASFT%20downloads/AnnualPlan1314\\_1516.pdf](http://www.swast.nhs.uk/Downloads/SWASFT%20downloads/AnnualPlan1314_1516.pdf) (accessed on 21/12/13)
- o South Western Ambulance Service NHS Trust (SWAST) (2011) Environment and Sustainability Strategy.

# Bibliography

- o Ursinus College (2013) What is Sustainability? Available at: <http://www.ursinus.edu/netcommunity/page.aspx?pid=4351> (accessed on 21/12/13)
- o Van Maanen, J. (2011). 'Ethnography as work: some rules of engagement'. Journal of Management Studies: 48, p. 218-234
- o Watson, T. (2011). 'Ethnography, reality and truth: the vital need for studies of "how things work" in organisations and management'. Journal of Management Studies: 48, p. 202-217
- o Hawkins, S (2013) 'Energy, Emissions and Emergency Medical Services: International research and policy issues' Lecture to the Centre for Social Care Innovation. Plymouth University 13th March
- o Richardson J., Nichols A., Pahl S., Grose J., Bennallick M (2011). How can behaviour change theory contribute to a reduce, re-use and recycle approach to waste management in the NHS: a feasibility study. Executive Summary 084 Sardinia 2011 Symposium Proceedings: CISA publisher, Italy
- o Richardson J., Nichols A., Pahl S., Wallace G., Jenkins R. (2011) The role of behaviour change in reducing, reusing and recycling waste in healthcare: a systematic review and thematic analysis. Executive Summary 085 Sardinia 2011 Symposium Proceedings: CISA publisher, Italy