

Communicating through COVID-19: public health, public transport and infection prevention



But these guys get a good clean

ROUTES OF INFECTION / ROUTES TO SAFETY: CREATIVE MAPPING OF HUMAN-VIRAL BEHAVIOURS ON THE BUS TO UNDERSTAND INFECTION PREVENTION PRACTICES



Dr Emma Roe* Geography and Environmental Science

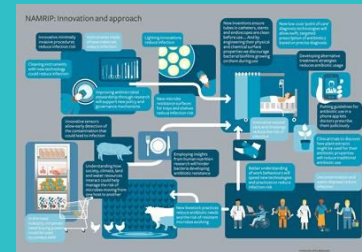
Dr Paul Hurley* Geography and Environmental Science / Artist

Dr Charlotte Veal† Landscape, Architecture and Planning

Dr Sandra Wilks* Health Sciences

*University of Southampton †University of Newcastle

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SLIDE DECK OVERVIEW

1. Overview of the interdisciplinary project. Dr Emma Roe.
2. The 'Distorted' bus environment.
3. You're never alone on the bus: microbiological sampling and sequencing of a city bus across multiple weeks. Dr Sandra Wilks.
4. Cultures of pandemic mis/information. Dr Charlotte Veal.
5. Novel public engagement. Dr Paul Hurley.



Routes of Infection / Routes to Safety:

RESEARCH METHODOLOGY

1. Social Science Research

- 50 hours of ethnography Feb - Oct 2021
- 37 semi-structured interviews - 10 bus drivers, 5 bus cleaners, 22 bus users

2. Microbiome Study

- swabs from a number of different sites on a bus at different points throughout the day and across seasons

3. Creative outputs

- four public education films mixing animation and live action
- development of microbial aesthetics from interviews and with stakeholder engagement

THE 'DISTORTED' BUS ENVIRONMENT

By Dr Emma Roe

Associate Professor in Human Geography, University of Southampton

E.J.Roe@soton.ac.uk

Twitter @emmaj_roe

MICROBIAL LANDSCAPES

Central to our thinking is the concept of ‘**microbial landscapes**’. This is a new term we are introducing to help describe and explain what is going on all around us, but in particular, on the bus.

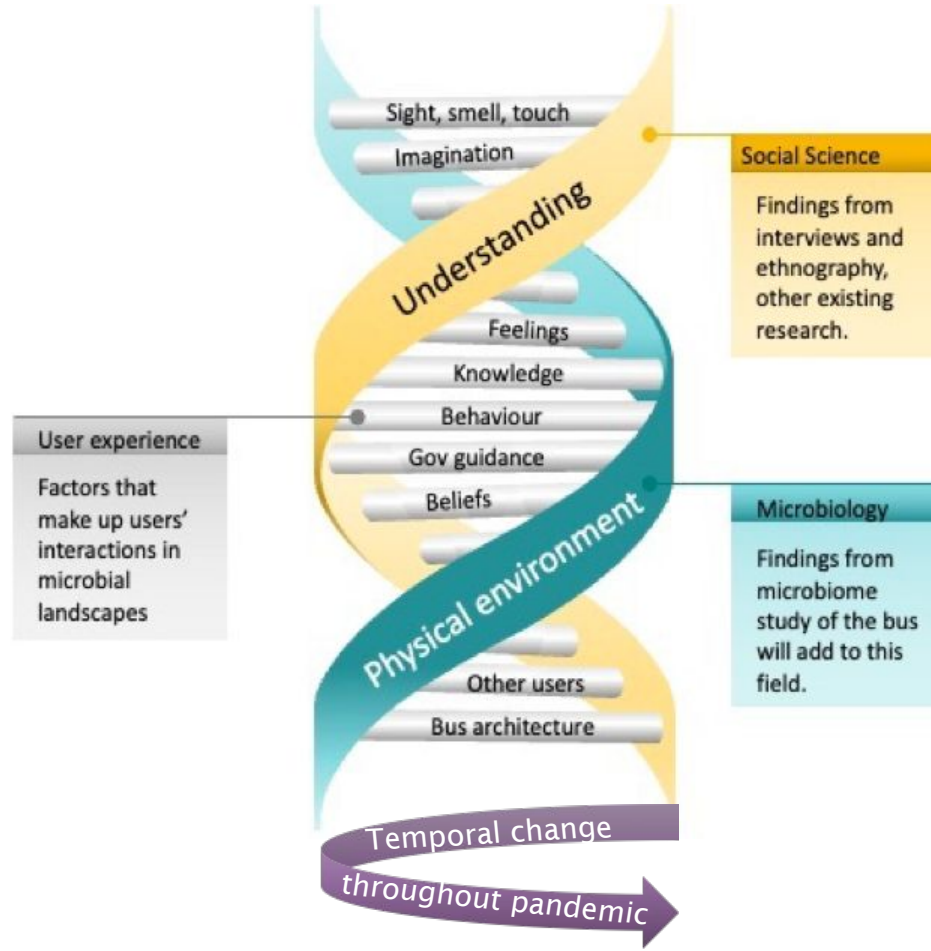
Microbial landscapes describes the intertwining

BETWEEN the various ways different bus passengers visualise and sense the bus environment,

AND the physical, material elements like other passenger bodies, bus architecture, viral particles and microbes.

Microbial landscapes are dynamic across the temporalities of day, different seasons, different passengers and the local dominance of evolving viral strains (alpha, delta, omicron of Covid-19 virus) and cleaning regimes, hand-sanitising, mask-wearing, and windows opening.

VISUALISING A CHANGING MICROBIAL LANDSCAPE



VENTILATING THE BUS: FRESH AIR

We were concerned to find the addition of Fresh Air to Government messaging was poorly known in relation to making the bus environment safer, in contrast to masks, hand-sanitising and social distance.

Less was said about managing, or seeking out, or being aware of open windows by our research interviewees, in contrast to other infection prevention measures..



PUBLIC TRANSPORT CHALLENGES

Distortion of normal bus environment: bus imaginations changed with new behaviours, interior re-organisation, etc.

Invisibility of source of threat: Covid-19 Pandemic has brought attention to buses' microbial landscape - on surfaces and in air - yet its invisibility creates problems about who to respond and feel about it.

Behaviours/feelings about microbial landscape: New feelings are being felt on and about the bus - caution, alarm, reassurance, confidence, relief.

YOU'RE NEVER ALONE ON THE BUS: MICROBIOLOGICAL SAMPLING AND SEQUENCING OF A CITY BUS ACROSS MULTIPLE WEEKS

Dr Sandra Wilks, Lecturer in Medical Microbiology /
Assistant Director of the Environmental Healthcare Unit, University of
Southampton.

S.A.Wilks@soton.ac.uk

Twitter: @wilks_sa

THE MICROBIAL SCENE

It's a microbial world...

- Microorganisms are everywhere – from deep sea vents to glaciers, from rock formations subsurface to rain clouds, from soil to everywhere in our homes, offices, vehicles, on and in us.
- It is estimated that our bodies have more microbes in and on them, than we have human cells.
- Microorganisms can exist in communities on surfaces and all material types.
- Studies have found all spaces to become colonised rapidly – and we need to think about how 'clean' we need places to be.

We will always share ourselves, our spaces and our air with microorganisms.

It is more than 'good' & 'bad' bugs...

- Microorganisms are essential to life in all kinds of ways:
 - They impact global processes and cycling.
 - We exploit them in many industrial processes e.g wastewater treatment, food production.
 - Exposure improves our immune system response.
 - They produce compounds we need for different metabolic processes and are essential for many functions.
 - They offer protection.
- Only approximately 1,500 pathogens that we know of, with human pathogens only representing around 1% of all the microbial species.

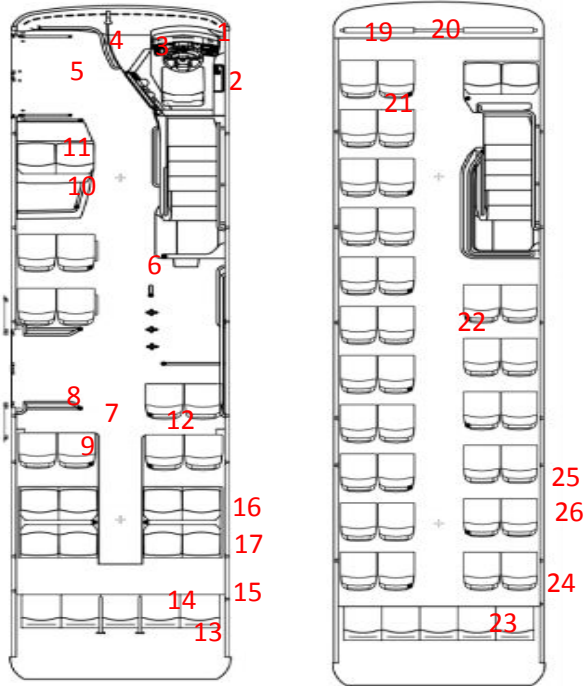
We need to understand this invisible community and help people to understand that we don't need sterility – we need to understand risk.

The bus microbiome - aims

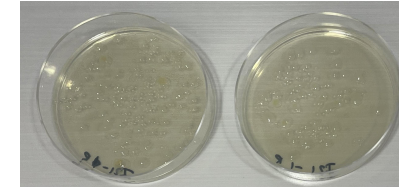
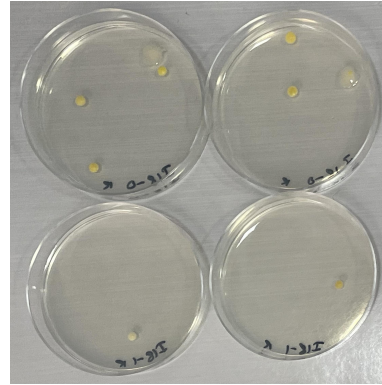
- To understand the diversity and prevalence of bacterial microorganisms on a range of sites on the bus:
 - Including different material types e.g. plastic, glass, stainless steel, fabric
 - Pre- and post-cleaning
 - With varying passenger density
- Use a range of methods to establish what is the community on the bus – and what is the community being introduced to the bus.
- Test for the presence of viral particles on the same surfaces.
- Provide data to illustrate that we are surrounded by microbial communities and open conversations on how we understand our links with them.

Methods

- Using a validated swab technique we are sampling sites on a number of buses – the same sites and area are swabbed on each.
- Bacteria and viruses are then released from the swabs into a solution.
- Bacteria are analysed by:
 - Culture where samples are plated onto different agar; total bacteria, environmental species, skin associated species.
 - Next generation sequencing.
- Viruses are analysed by:
 - Real-time PCR technique that detects the presence of viral particles.



Sampling sites around the bus.



Bacterial colonies on standard and R2 agar. Total bacterial numbers and environmental species.



Bacterial colonies on Columbia Blood agar - skin-associated species.

What are we finding?

- Numbers of bacteria vary from bus to bus and from sample to sample.
- High touchpoint areas, such as grab rails, have very low numbers following cleaning but increase with passenger use.
- There are differences between different areas e.g. seating has more 'human' species while floors have more 'environmental' species.
- The amount and diversity we are finding are similar to other studies of shared spaces e.g. domestic settings, offices, hospitals.

The link between these communities and risk remains poorly understood.

How can we use this information?

- By understanding the distribution and composition of the communities, we can help educate people about risk.
- Use the information to show how simple interventions such as touchpoint cleaning, mask wearing, hand hygiene can impact on microbial communities.

Work to make the invisible microbial world visible.

Public Transport challenges: Summary

Bus stigmatisation and cleaning: Unfair buses declared dirty. Buses are clean and passengers can do more to reduce the 'stuff' they bring on with them from the macro like litter, to micro like virus, bacteria and fungi. For economic and environmental interests we need to cultivate collect interest of bus-users to cleaner bus environment.

Surface Cleaning: Bus operators' surface cleaning regimes work. Microbial communities reduce from cleaning. However complex picture as don't know how much, when and what types of invisible microbiome pose risk to humans.

CULTURES OF PANDEMIC MIS/INFORMATION

By Dr Charlotte Veal

Lecturer in Landscape Architecture, Newcastle University

Charlotte.Veal@ncl.ac.uk

Twitter: [@animating_space](https://twitter.com/animating_space)

1. **CONFUSION ABOUT THE SCIENCE:** A lack of scientific clarity on COVID-19 infection risks (about spread, vaccine, and spaces of perceived 'high' risk like the bus) and the circulation of misinformation. Need to recognise the important role social and cultural dimensions play in public health adherence.
2. **SIMPLICITY OF GOVERNMENT GUIDANCE:** Government guidelines about how to behave (if not the reasoning for doing so) was initially widely understood and adhered to by bus users as the way to stay safe. Cautionary guidelines were welcomed and resonated largely with bus users' fears about the virus. Communicating science effectively (with appropriate forms/language) is key to achieving collective behaviours and confidence among those for English is not first language.
3. **REDUCING EFFECTIVENESS OF COVID-19 MESSAGING:** the government's simple messaging has become less effective. The scientific communications have become more confusing for a number of reasons. Different bus users have increasingly made their own decisions/rationale about how to behave in and around taking the bus. Need novel ways to engage users with public health measures in ways that translate across communities.

PASSENGERS EXPERIENCES OF PUBLIC HEALTH MESSAGES

“he (Johnson) say he, using the face mask and also making social distance and opening the window is, you know, and letting in for fresh air, it’s protecting the people and also it is alleviating the risk of the Covid and reduce transmission”
(Amin, Passenger)

Yeah, it is a challenge, but at the same time we’ve just got to make sure that they’re open 24/7. That’s it when it comes to that because it is a government rule now. Scientists have said, “**Keep your windows open,**” it gets rid of Covid as far as I’m concerned, and we should follow that.” (Maalik, passenger)



COMMUNICATION

‘the world leaders are not telling us **the truth**. They have just used something, just a little thing to deceive the world that there is a virus because you hear today it’s India virus, tomorrow it’s South Africa virus, today this virus. So you don’t know what kind of virus you are in now, whether it’s a world virus or something different. So it’s, we are praying to God that everything will pass by soon’ (James, cleaner).

‘They could have been improved because there were a lot of mischief around this COVID because tomorrow they will say this, the following day they will say a different thing. The communication is very strict like do this. (...) but if the minister you tell me this, then tomorrow minister you do different thing. It means you are the senior members in the government you are not following the regulations. You expect the citizens to do that, but you are not doing it. So the communication was very poor, and how **they communicate sometimes it’s no good.**’ (James, Cleaner)



SOURCES OF INFORMATION

“And as a **Muslim person you got a duty** not to put yourself at risk but also not to put others at risk when you know you're not well. So, like what happened in the past, during this pandemic is people, they shouldn't leave [...] their city or in their house. And that was making easy people to stay indoors. And also he also mentioned, you know, knowing that you infected and interacting with others is like committing suicide, you know, throwing yourself into fire. And that is religious view, that's what Prophet say.”
(Aden, passenger)

TRANSLATION

“the information from like the news, [...] it’s kind of confusing I would say, because sometimes I kind of feel like I understand what’s going on and sometimes I feel like I don’t know what’s going on. Sometimes I feel like it’s clear and sometimes I just don’t. (...) On the government website, if they had like some kind of **translation button** or something like that where people could be like okay this is a website that they wouldn’t be having misleading information, so I can trust this information and like, you know, read it for themselves, instead of like finding out [through other people and stuff’ (Yasmin, passenger).



KNOWLEDGE SATURATION

A: I **don't listen to the news** that much. I just stay updated on my phone from time to time. [...] If not, I'm not too up to date with it, if you get what I mean.

Q: Yeah, yeah, yeah. So you know that if there's something really important to know, then you'll get it on your phone in some way?

A: Yeah, yeah, I'll see it, I'll see it. (Musa, Passenger)

'Really, I don't believe because any time I put me in my situation sometimes when they start with that virus, and they lockdown and everything, everybody just take the shopping and go and stay closed in the house. Me, in that time, I was not scared, and I go everywhere out. I go in the shop with no gloves, without no antibacterial on my hands, nothing, but I don't know, I still was safe. So if these people, they are dying so many people, then I'm happy for me to see, you know, **because I didn't protect myself for nothing and I still got nothing**. So be honest I don't know what is going on.'(Sasha, cleaner)

NOVEL PUBLIC ENGAGEMENT

By Dr Paul Hurley

Senior Research Fellow in Human Geography, University of Southampton

P.D.Hurley@soton.ac.uk

Twitter: @drpaulhurley

DISSEMINATION/ENGAGEMENT VIDEOS

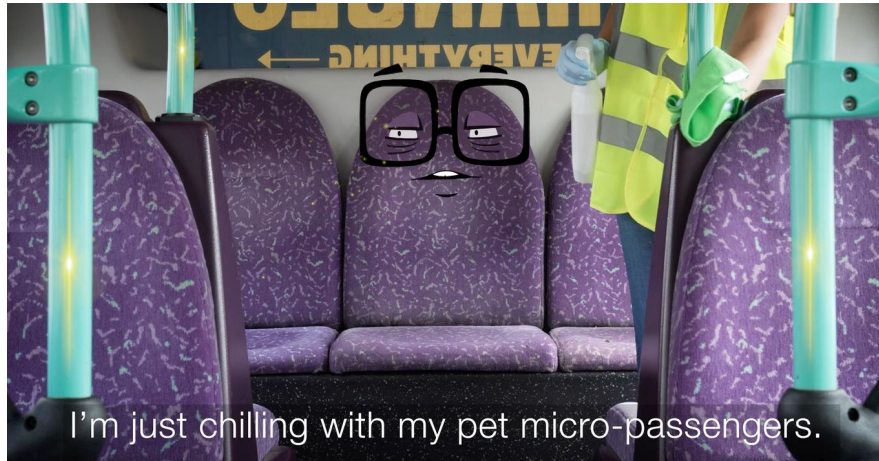
Aesthetic parameters:

- Represent human and microbial communities on the bus
- Focus on nonhuman characters
- Use humour instead of shock tactics or didacticism
- Create positive rather than negative messaging
- Don't anthropomorphise (of monsterise) microbes as individuals
- Acknowledge microbes' invisibility to humans, but somehow represent them.

YOU'RE NEVER ALONE ON THE BUS

Films available to share, download and re-use for free at

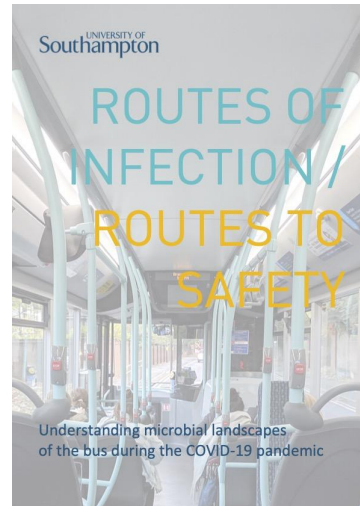
<https://generic.wordpress.soton.ac.uk/routestosafety/outputs/>



STAKEHOLDER REPORT

Available to download for free at

<https://generic.wordpress.soton.ac.uk/routestosafety/outputs/>



Interim Report
December 2021

Routes of Infection / Routes to Safety

UNDERSTANDING MICROBIAL LANDSCAPES OF THE BUS DURING THE COVID-19 PANDEMIC

by Emma Roe*, Charlotte Vial**, Paul Hurley*** and Sandra Wiks****

*General Practice, Geography and Environmental Science, University of Southampton

**Lecturer, Architecture, Planning and Landscape Research Institute

***Senior Research Fellow, Geography and Environmental Science, University of Southampton

****Lecturer, Biological Sciences, University of Southampton

EXECUTIVE SUMMARY

This report is provided for stakeholders involved in the provision and management of public transport services where there is a risk of community transmission of COVID-19 and other infectious such as seasonal colds, flu, and norovirus. It provides analysis of everyday bus user experiences within the changing conditions of the COVID-19 public health crisis, March 2020 onwards.

Central to our thinking is the concept of 'microbial landscape'. This is a new term we are introducing to help describe and explain what is going on all around us, but in particular, on the bus.

