CREATOR(S): MACDUFF, C., MACDONALD, A. and TSATTALIOS, K.

TITLE: Unlocking the potential of visualisation approaches to address healthcare associated infections: a new international, cross-disciplinary network.

YEAR: 2017

Unlocking the potential of visualisation approaches to address healthcare associated infections: a new international cross-disciplinary network

Colin Macduff, Alastair Macdonald and **Kostas Tsattalios**

ACIPC, Canberra, November 2017

The Glasgow School of Art

Arts and Humanities Research Council

Overview of presentation

- Introduction to the network rationale and core team
- Review of work to date based around network's objectives and processes
- Particular focus on emergent mappings of areas of need and opportunity
- Next steps

Rationale: why bother about visualisation?

- The use and experience of visual images in their many forms is a taken-for-granted aspect of endeavours within IPC
- Contemporary IPC presents both enduring visualisation challenges (e.g. the invisibility of pathogenic organisms in practice contexts) and new opportunities (e.g. the potential of computer graphics to meaningfully portray patterns in the conjunction of pathogens, places and people)
- Research and development in this field is as yet very limited in nature and there is scope for substantive advances – seeing helps believing
- *See discussion section in article below for a flavour of some of the issues*

  Macdonald, A; Macduff, C; Loudon, D and Wan, S (2017) Evaluation of a visual tool co-developed for training hospital staff on the prevention and control of the spread of healthcare associated infections. *Infection, Health and Disease* 22 (3) pp. 105 -116

HAIVAIRN

Healthcare **A**ssociated **i**nfection **v**isualisation **A**nd **I**deation **R**esearch **N**etwork

How can we better address the problem of HAIs through visualisation-related ideation and applications?

An ambit ranging from visualisation of *micro, unseen phenomena* such as pathogens and the mind's eye, to visualisation of *macro phenomena* relating to human interactions in particular healthcare environments.

www.visionon.org

Funding from Arts and Humanities Research Council, UK

HAIVAIRN core team

Prof Alastair S Macdonald
Senior Researcher School of Design, The Glasgow School of Art

Dr Colin Macduff (*formerly* at RGU, Aberdeen)
Senior Research Fellow, HAIVAIRN, The Glasgow School of Art

Kostas Tsattalios
Affiliated PhD Student, Robert Gordon University, Aberdeen

HAIVAIRN (June 2016 –Jan 2018): objectives

- To coalesce a diverse range of national and international expertise around visualisation-related ideas to address the prevention and control of HAIs, working from a foundation in arts and humanities
- Through a series of 3 workshop events, to explore and identify areas of research need and opportunity, articulating possible cross-disciplinary contributions
- To create a set of visual mappings locating main priority themes for inquiry, promising sub-themes and related loci and foci for cross-disciplinary interactions
- To generate a range of relevant researchable questions from this basis
- To develop these as feasible cross-disciplinary proposals
- To disseminate network activities to increase visibility and connectivity in this field

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Coalescing a diverse range of national and international expertise

Prof Brett Mitchell, Avondale College Faculty of Nursing & Health, Sydney, Australia. Expertise: **nursing.**

Prof Daniyal Zuberi: RBC Chair and Associate Professor of Social Policy, University of Toronto. Expertise: **social and public policy**.

Prof Stephanie Dancer, Medical Microbiology, Lanarkshire NHS Trust and Edinburgh Napier University. Expertise: **microbiology.**

Dr David Pearson, Reader, Anglia Ruskin University, Cambridge. Expertise: **psychology, cognitive science, brain and cognition.**

Dr Sarah-Anne Munoz, University of Highlands and Islands. Expertise: **rural health, health geography, community engagement.**

Associate Prof Catherine Stones, School of Design, University of Leeds. Expertise: **graphic design and visualisation.**

Dr Gavin Miller, Director, Medical Humanities Research Centre, Glasgow University. Expertise: **english lit/medical humanities**.

Dr Dilum Dissanayake, Lecturer, Planning & Management, University of Newcastle. Expertise: **transport modelling.**

Prof Paul Crawford, Professor of Health Humanities, University of Nottingham. Expertise: **health humanities.**

Audrey Bell, Acting Head of Facilities Management NHS Grampian. Expertise: **facilities management/domestic services.**

Midge Rotherham, Support Services Manager, NHS Fife. Expertise: **facilities management/domestic services.**

Dr Mark Powell, Civil Engineering Department, Newcastle University. Expertise: **anthropology.**

Dr Phil James, Urban Observatory, Newcastle University. Expertise: **systems programmes, software development**

Workshop events

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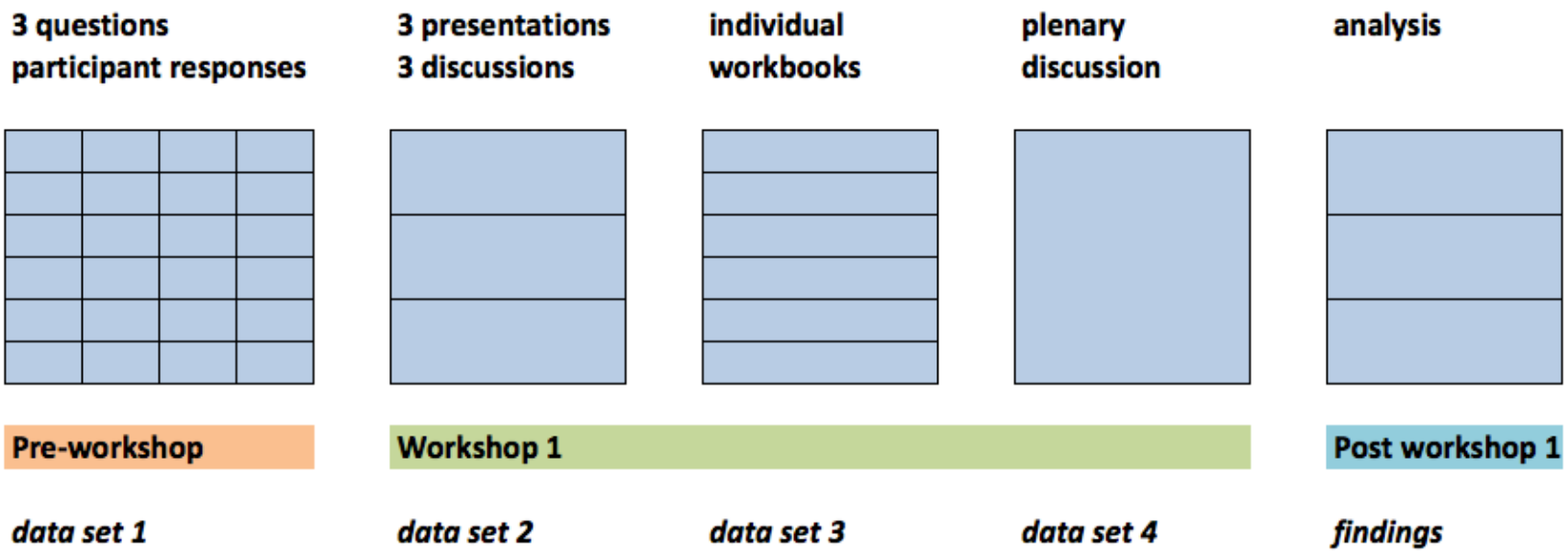
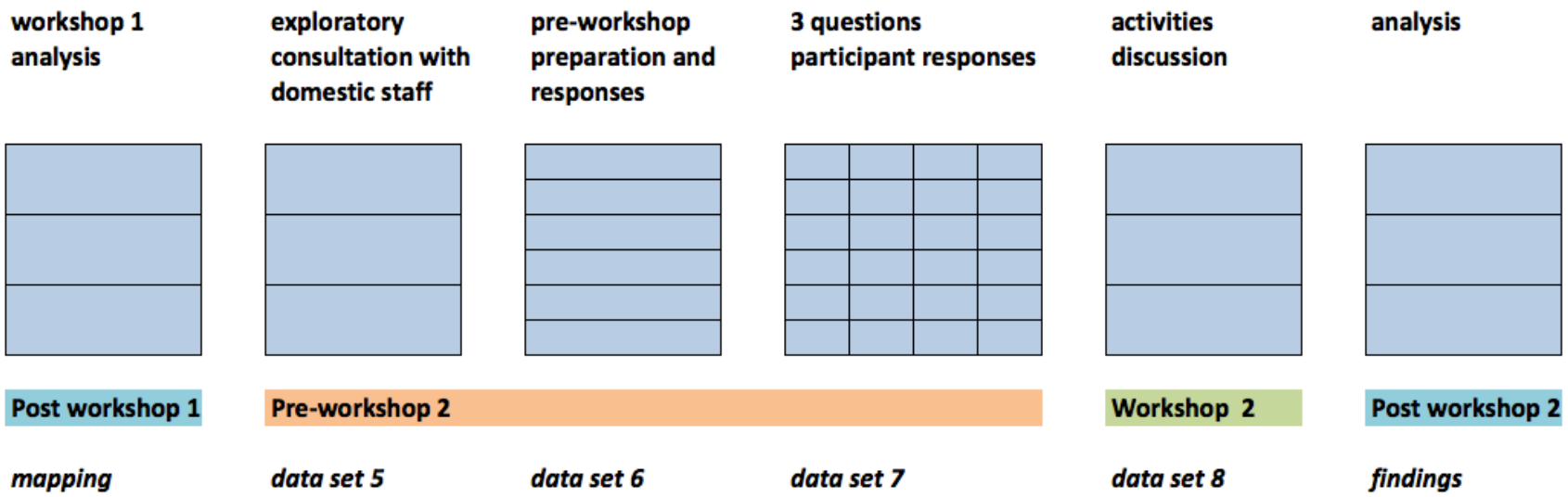
Workshop 1: processes and data capture



Workshop events

HAIVAIRN

Workshop 2: processes and data capture



Example of a foundational pre- workshop question

What do you understand visualisation to mean in the context of your discipline?

"*A visualisation in my field is more commonly a designed artifact"*

"...most often relates to the visualisation of spatially referenced data within maps"

"...the system we choose to visualise will be dependent on the nature of the problem and the prejudices and expertise that the team involved brings to the table..."

"...refers to a process in which an individual represents information using visual representation. This can take the form of either internal mental representations (i.e. mental images) or external representations (sketches, models...)"

Themes included: generation; formation; representation; illustration; illumination

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Key questions emerging from workshops

1) What is, and has been, going on regarding the less visible/invisible experiences of key groups involved in the prevention and control of HAIs (and how do we best apprehend and understand these)?

2) What is, and has been, going on regarding the location and movement of pathogenic microrganisms within and outwith clinical environments (and how do we best visualise and understand these phenomena)?

4) How can health and social care practices within this field be best improved through understanding and application of visual-related approaches (and what data and analysis methods are necessary)?

3) What is, and has been, going on in terms of policy and practice in communicating risk in this field through visual and other means (and how do we best investigate and understand this)?

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MICRO
Invisible / less visible

1) What is, and has been, going on regarding the less visible/invisible experiences of key groups involved in the prevention and control of HAIs (and how do we best apprehend and understand these)?

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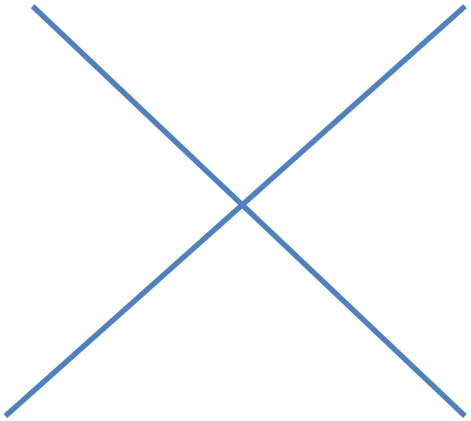


PERSON Oriented

CONTEXT Oriented

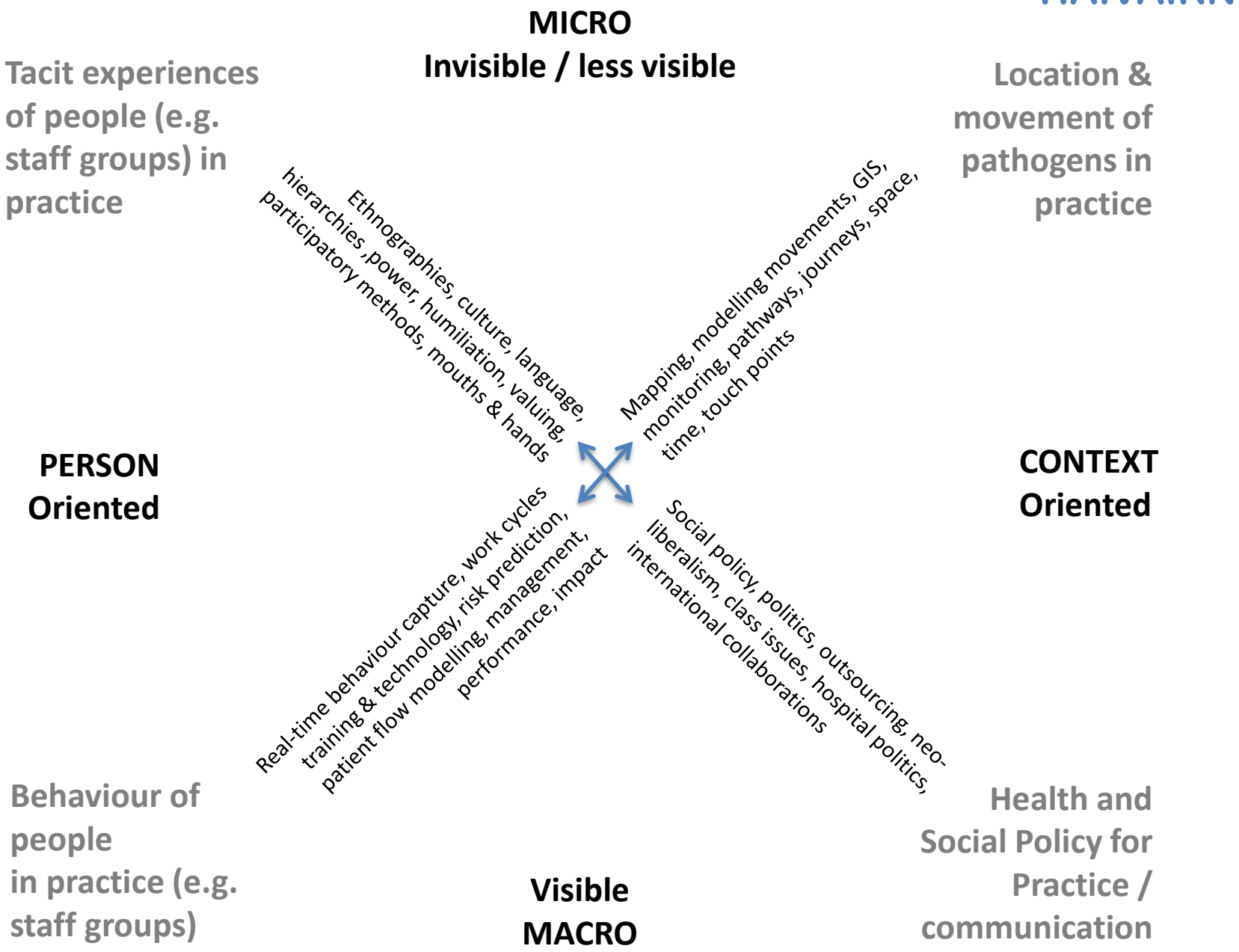
4) How can health and social care practices within this field be best improved through understanding and application of visual-related approaches (and what data and analysis methods are necessary)?

3) What is, and has been, going on in terms of policy and practice in communicating risk in this field through visual and other means (and how do we best investigate and understand this)?

Visible
MACRO

Areas of research **need and opportunity** for visualisation approaches to HAIs (topics and methods)

HAIVAIRN



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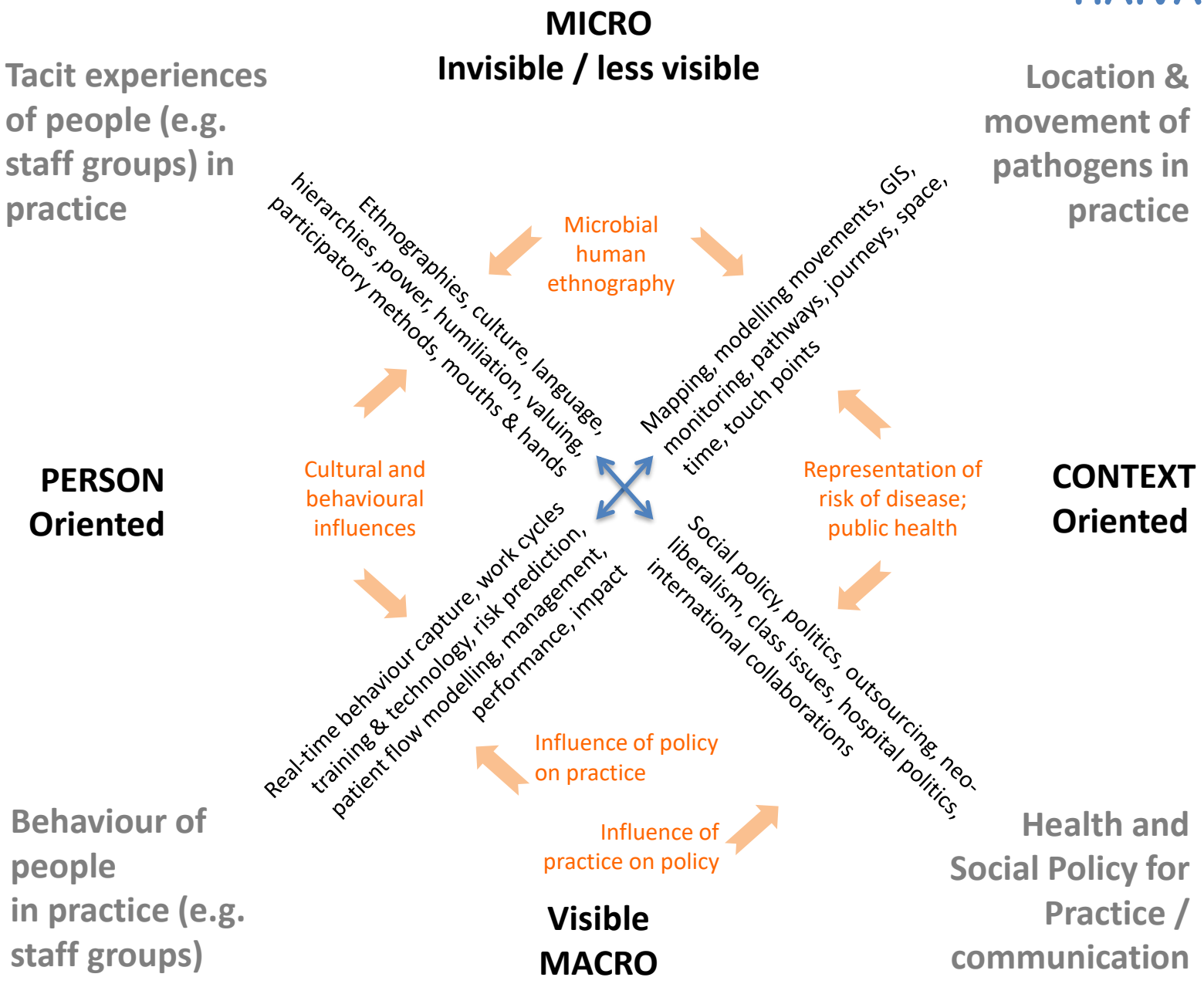
HAIVAIRN



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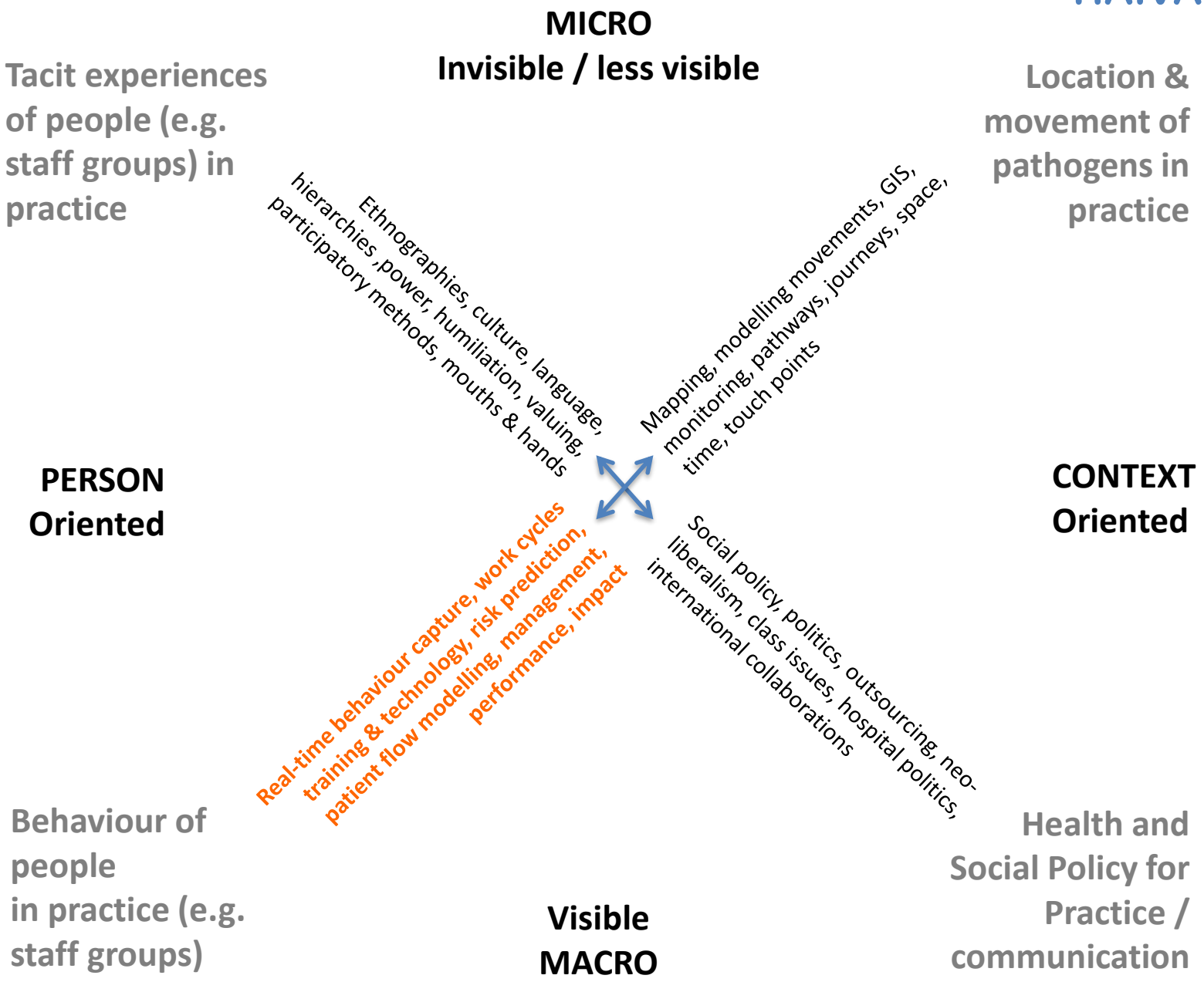
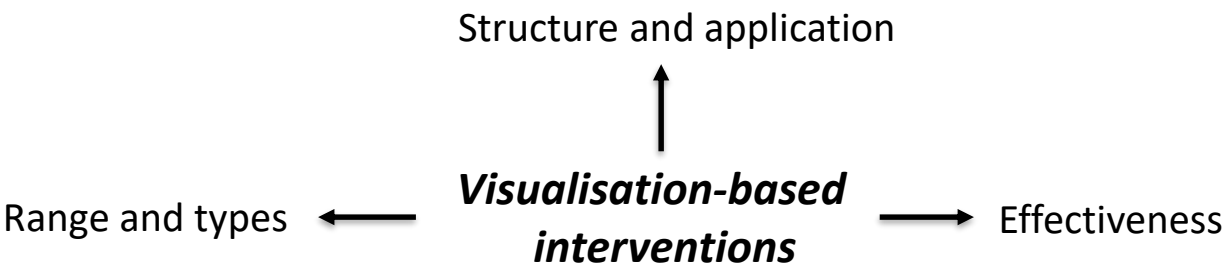


Zooming into the bottom left hand quadrant (see next presentation!)

Kostas Tsattalios, PhD Student, RGU, Aberdeen

- **PhD work**: "*Developing recommendations for behaviour change interventions in the 'healthcare-associated infections' field: the role of theory and visualisations*"
- **4 phases**: *-Integrative review 1: theory*
  -Integrative review 2: visualisations
  -Delphi study
  -Focus groups with nurses and nursing students



Developing related proposals: examples of recently funded studies (spanning a range of the quadrants)

Lifting the Lid on Bacteria: Designing ambient communications to improve hygiene in primary school toilets. PI: Associate Professor Catherine Stones, School of Design, University of Leeds. AHRC funding: £ 242,913

AMRSim: A Microbial Reality Simulator. PI: Professor Alastair Macdonald, School of Design, Glasgow School of Art. AHRC funding: £ 249,994

RIPEN: Re-envisaging Infection Practice Ecologies in Nursing through Arts and Humanities Approaches. PI: Dr Colin Macduff, School of Design, Glasgow School of Art . AHRC funding: £ 243,799

Summary of HAIVAIRN achievements to date

Objectives met, including international dissemination (IPAC Canada and ACPIC Australia). Final workshop (3) very recently completed.

Beyond objectives:

1) Foundational uni-disciplinary understandings were gathered on key concepts

2) The three related research proposals so far have all gained funding

3) An integrative review on visual interventions in HAIs has been undertaken as part of PhD work and will be written up for journal publication

4) HAIVAIRN model may emerge as potentially useful for advancing cross-disciplinary research curiosity in a new area

5) HAIVAIRN could be a catalyst for a more substantive and integrated articulation of the wider A&H contribution to addressing the AMR challenge

Next steps

1) Prepare final project report

2) Update website: see http://visionon.org/haivairn

3) Prepare related funding bid to develop the work as part of a wider A&H initiative

4) Prepare related publications

Acknowledgement

This network has been funded through a grant (AH-N006429/1) from the Arts and Humanities Research Council. We would like to gratefully acknowledge this support as well as the participation from colleagues across a range of disciplines and settings.