# Life after Accelerator Physics: Public Health Research

## Hannah Harrison

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# Quick Introduction

- 2010 – 2014: MSci in Physics (Imperial)

- 2014 – 2018: DPhil in Accelerator Physics (Oxford)

  *Thesis: The Design of a Single-Shot Longitudinal Bunch Profile Monitor Using Smith-Purcell Radiation*

- 2018 – 2020: NIHR Research Methods Fellowship (Cambridge)

  Included Mphil in Primary Care Research Methods

  *Thesis: Validation of Risk Prediction Models for Kidney Cancer using the UK Biobank Cohort*

- 2020 – 2021: NIHR Development and Skills Award (Cambridge)

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# Why Public Health?

- Breadth of research topics
  - Methods – data science, epidemiology, qualitative research
  - Areas – chronic illness, infectious disease, inequalities in healthcare
- Multidisciplinary team
  - Clinicians, statisticians, clinical academics, non-clinical academics, data managers, medical librarians
- Overlap in skills
  - Statistics
  - Computing skills (data management, algorithm/model development)
  - Research skills

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# Project Overview

Screening Tests

Cost Effectiveness

Benefits and Harms of Screening

**Risk Stratified Screening**

Screening for Kidney Cancer

Public Acceptability

Risk Communication

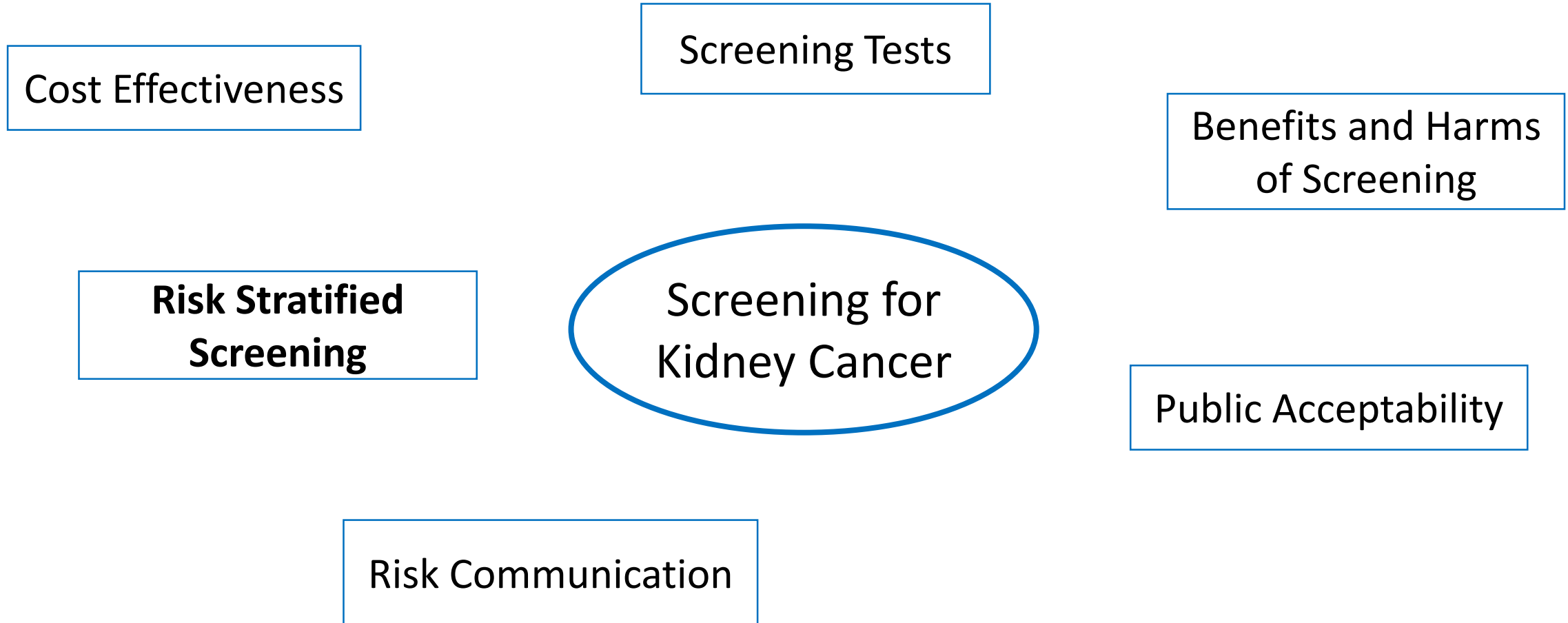Hannah Harrison
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# Kidney Cancer Screening

- There are 13,000 new cases of kidney cancer in the UK each year [1]

- Results in about 4500 deaths annually
  - Often asymptomatic at early stages
  - 25% of individuals have metastasis at diagnosis

- Screening program?
  - Could help improve early detection
  - Kidney cancer has a relatively low prevalence
  - Harms of screening could easily outweigh benefits

- Risk stratification could provide a solution
  - Models using demographic, lifestyle, biomarker or genetic risk factors
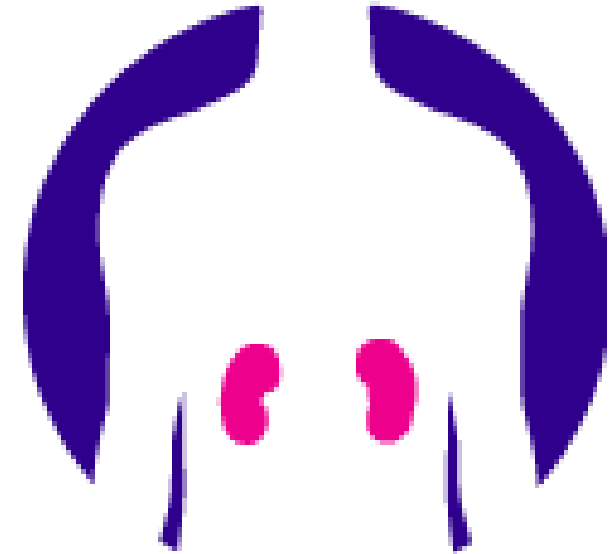
1. Cancer Research UK. *Kidney Cancer Statistics*. Available from: https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/kidney-cancer  [Accessed: 01/10/2019]

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# Risk Stratified Screening

- What work has already been published in the area?

Harrison, H., Thompson R. E., Lin Z., Rossi S. H., Stewart G. D., Griffin S. J., and Usher-Smith J. A., "Risk Prediction Models for Kidney Cancer: A Systematic Review", *European Urology Focus,* (2020)

- How does existing research perform?

*Validation of Risk Prediction Models for Kidney Cancer using the UK Biobank Cohort (MPhil Thesis)*

- Model development

- Could this be incorporated into another screening programme?

- Is using a model to select for screening acceptable to the public?

Harvey-Kelly L. L. W., Harrison H., Rossi, S. H., Griffin S. J., Stewart G. D.,  Usher-Smith J. A., "Public attitudes towards screening for kidney cancer: an online survey", BMC Urology (2020)

Usher-Smith, JA, Harvey-Kelly, LLW, Rossi, SH, Harrison, H, Griffin, SJ, Stewart, GD. Acceptability and potential impact on uptake of using different risk stratification approaches to determine eligibility for screening: A population-based survey. *Health Expectations*. (2020)

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# Public Health Modelling

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