

# The PFAS Health Study

Presentation to the Oakey Community

6 December 2018

National Centre for Epidemiology & Population Health

Research School of Population Health

Australian National University



Australian  
National  
University

# Plan for today

- Systematic review findings
- Focus group study findings
- Next steps for Phase II
  - Blood serum study
  - Cross-sectional survey
- Questions

# Community Reference Panel

- 2 members from Williamstown
- 2 members from Oakey
  - Lorraine Bonnyman
  - Mark Hogg
- 3 members from Katherine, with the potential to add 2 more Aboriginal community members

# **ANU PFAS Systematic Review**

PFAS Health Study Phase I

2016–2018

Dr Katherine Todd

National Centre for Epidemiology and Population Health

# What is a systematic review?

- Clear research question
- Review of published research
  - Including grey literature
- Risk of bias assessment
  - Research design, methods and results
- Documented methods
  - Review can be reproduced or updated

# The PFAS systematic review

1. To review what is currently known about the effect of PFAS chemicals on human health
2. To assess the risk of bias in the reviewed research

# Searching for research

1. Key words related to PFAS exposure and human health
2. Search research databases
3. Download all research related to key words
4. Remove duplicates
5. Search titles, abstract and full-text

# Research papers included

- Identified **7,205** research papers
- Removed 3,978 duplicates (3,227 remaining)
- Identified 2,714 papers in grey literature
- Excluded 6,485 papers (207 remaining)
- Identified 14 additional papers through cross referencing all references of the 207 papers
- Final review of 221 papers



## Examples of titles excluded

- Associations between perfluoroalkyl compounds and immune and clinical chemistry parameters in highly exposed bottlenose dolphins
- Home produced eggs: An important pathway of human exposure to perfluorobutanoic acid (PFBA) and perfluorooctanoic acid (PFOA) around a fluorochemical industrial park in China

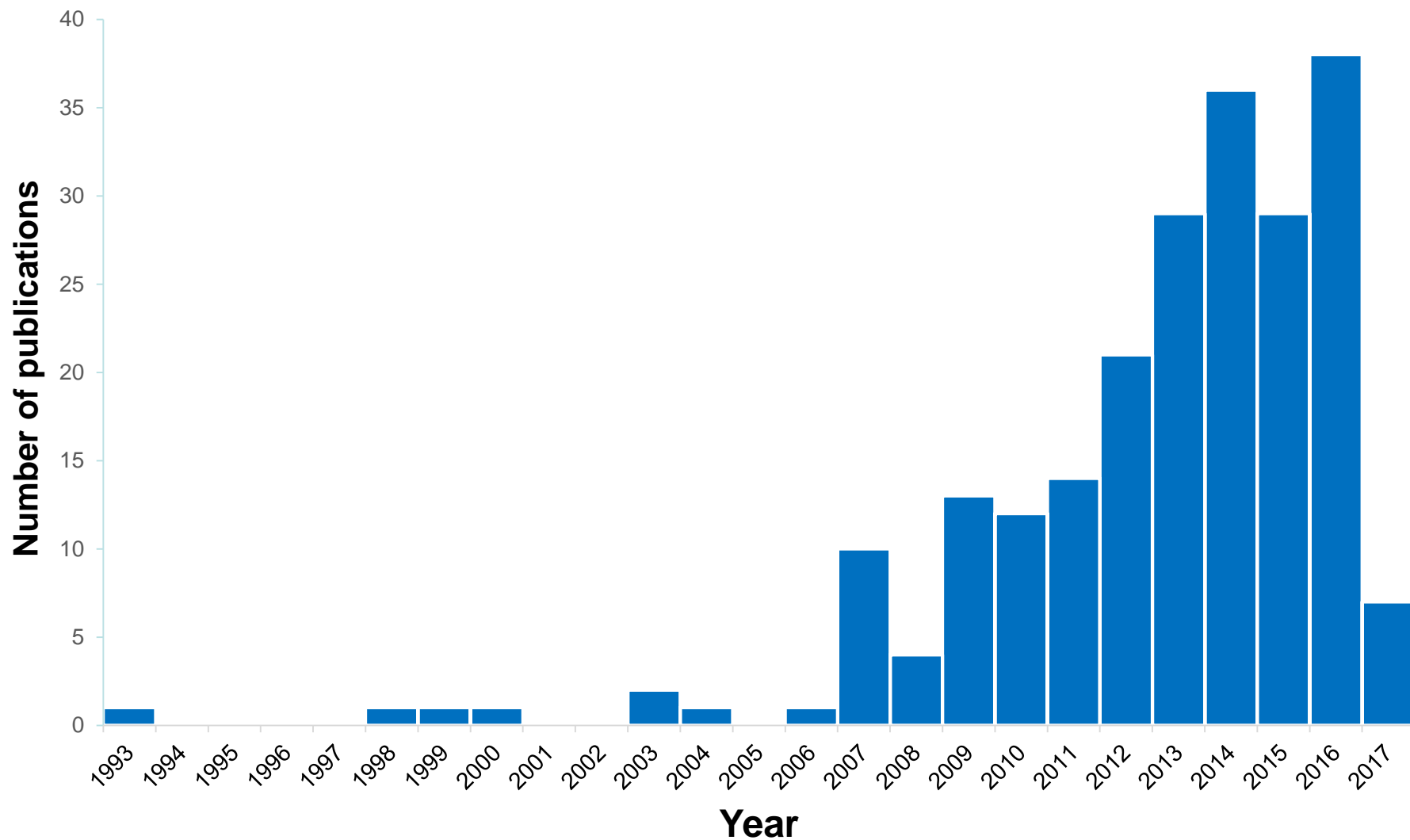
# Example of abstracts excluded

## One-year follow-up of perfluorinated compounds in plasma of German residents from Arnsberg formerly exposed to PFOA-contaminated drinking water

### Abstract

In Arnsberg, Sauerland area Germany, 40 000 residents were exposed to PFOA-contaminated drinking water (500-640 ng PFOA/l; May 2006). In July 2006, the PFOA-concentrations in drinking water were lowered significantly by activated charcoal filtering in the waterworks, mostly below the limit of detection (10 ng/l). A first human biomonitoring study performed in autumn 2006 revealed that PFOA-concentrations in blood plasma of residents living in Arnsberg were 4.5–8.3 times higher than in the reference groups. One year after the first survey, all participants (2006: 164 mothers, 90 children, 101 men) were invited to take part in a follow-up study. It was the aim of the study to determine the decline of the PFOA-concentrations in blood plasma. 288 persons (81%) were included in the statistical analysis. The (geometric) mean PFOA-concentrations in blood plasma of Arnsberg's residents decreased from 22.1 to 17.4 µg/l in children, from 23.4 to 18.8 µg/l in mothers and from 25.3 to 23.4 µg/l in men within one year. The average (geometric mean) changes in each individual's PFOA-concentrations were approximately 10 (men), 17 (mothers) and 20 (children) percent/year. The observed decline in PFOA-concentrations indicates a slow elimination in humans. This finding in groups of the general population is in agreement with data on long elimination half-lives observed in occupationally exposed workers.

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# Research papers included

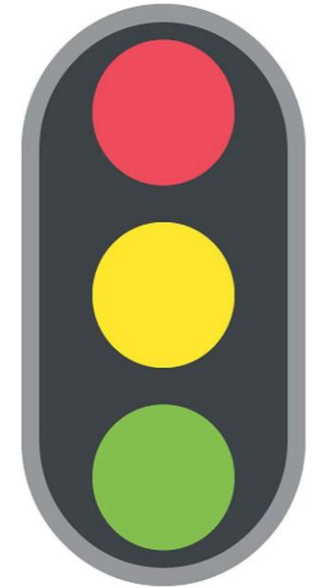
- 19 different types of PFAS
- 3 different types of exposure
  - Occupational exposure
  - Community-wide exposure
  - General population studies
- 148 health outcomes
  - These were across 12 broad categories

# Health outcome categories

1. Neonatal, infant and maternal
2. Reproductive
3. Metabolic
4. Thyroid
5. Neurodevelopmental and neurophysiological
6. Cancers
7. Diabetes
8. Cardiovascular
9. Overweight and obesity
10. Immunological
11. Skeletal
12. Respiratory

# Evaluating the strength of evidence

- Sufficient evidence
- Limited evidence
- Inadequate evidence
- Evidence suggesting lack of a health effect



## Sufficient evidence of a health effect

- **High cholesterol levels** (PFOA, PFOS)
  - Increased total cholesterol level

## Limited evidence of a health effect

- High uric acid level (PFOA, PFOS)
- Reduced kidney function (PFOA, PFOS)
- Chronic kidney disease (PFOA, PFOS)
- Kidney and testicular cancer (PFOA)
- Effects on the immune response to vaccinations
  - Diphtheria (PFOA, PFOS, PFHxS, PFDA)
  - Rubella (PFOA, PFOS)



# Summary

- This is an emerging area of research
- These results can change as more studies are published
- We are using these findings to guide our blood serum study, cross-sectional survey and data linkage project

# **PFAS focus group study**

PFAS Health Study Phase II

2018

Professor Cathy Banwell

National Centre for Epidemiology and Population Health

# What is a focus group

- Commonly used in health research
- Small group of people
- Discussions of public knowledge, attitudes, perceptions and opinions
- May reveal underlying concerns to researchers
- Often used to inform survey research

## Study aim

- To understand participants' views and experiences of PFAS contamination in their local area
  - The focus was on participants' health concerns

# Focus group sessions

- **Oakey** – January/February 2018
  - 3 community groups, 1 Defence
- **Williamtown** – February 2018
  - 3 community groups, 1 Defence
- **Katherine** – August 2018
  - 3 community groups, 1 Defence, 3 Aboriginal groups

# Participants

- 180 participants

Oakey	Williamtown	Katherine
36 participants	46 participants	98 participants

- Most participants were ....
  - Over 50 years old
  - Retired or working full-time
  - Had lived in the area for more than 10 years

# Main discussion themes

- Physical health concerns
- Mental health concerns
- Environmental testing
- PFAS blood testing
- Financial concerns
- Community trust and cohesion
- Local conditions and exposure pathways
- Ways forward

# Health concerns

- Children's health
- Adult's health, cancer, deterioration of existing conditions

“*not knowing*” about physical health contributes to:

- Stress and anxiety



# Uncertainty and lack of trust

- Environmental testing and exposure pathways
- PFAS blood testing
- Financial situation

*“Stuck” “Trapped”*

## Ways forward

- Transparent and consistent information
- Guidance on what to do

# Study outcomes

- A report has been prepared and will shortly be published on our website
- The information collected has been used to develop questions for the cross-sectional survey

# Next Steps

PFAS Health Study Phase II

2019

Dr Katherine Todd

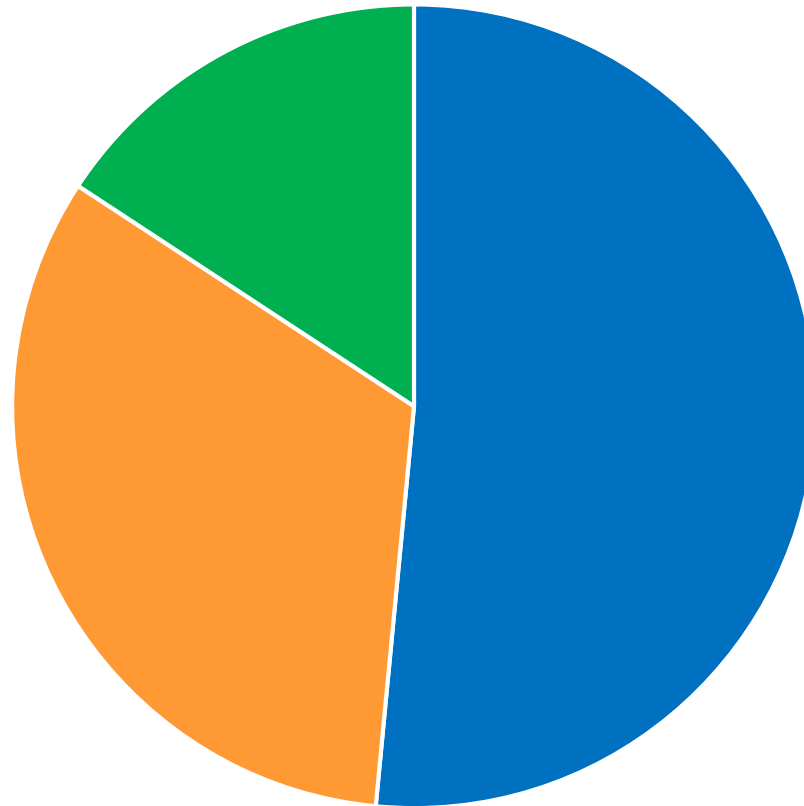
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# Survey and blood serum study

- Cross-sectional survey
  - Survey available online or hard copy (with a pre-paid return envelope included)
  - Opens early 2019
  - Closes mid 2019
- PFAS voluntary blood testing program
  - Available until 30 April 2019

# Current number of blood samples

>1,500  
blood  
samples



■ Williamtown    ■ Katherine    ■ Oakey

# Why should you participate?

- Completing a survey helps identify
  - PFAS exposure pathways
  - Health outcomes, including chronic illness, cancer and mental health
- The survey will be linked with PFAS blood serum results

## VBTP participants

- If you have already participated in the VBTP you will be **posted a hardcopy questionnaire** & a link to the online version, should you wish to complete it online



# Study findings

- Combined blood serum & cross-sectional survey final report
  - Mid 2020

## Data linkage

- Look at rates of health outcomes that may be associated with PFAS exposure
- See whether these are higher among people who have ever lived in Williamstown, Oakey and Katherine compared with the general population
- Involves linking Medicare address data from 1984 with cancer data, death data, perinatal data and hospital data sets
- Finalised December 2020

# Contacting the ANU Research Team

PFAS Health Study Coordinator

[Katherine.Todd@anu.edu.au](mailto:Katherine.Todd@anu.edu.au)

(02) 6125 9497

Study Email & Website

[Pfas.Health.Study@anu.edu.au](mailto:Pfas.Health.Study@anu.edu.au)

[Nceph.anu.edu.au/pfas-health-study](http://Nceph.anu.edu.au/pfas-health-study)