

# **My Elective:**

## **Improving the Detection of Tuberculosis in South Africa**

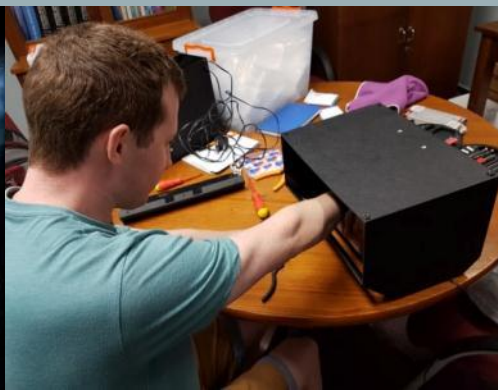
**17<sup>th</sup> November – 09<sup>th</sup> December 2018**

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07/01/2019

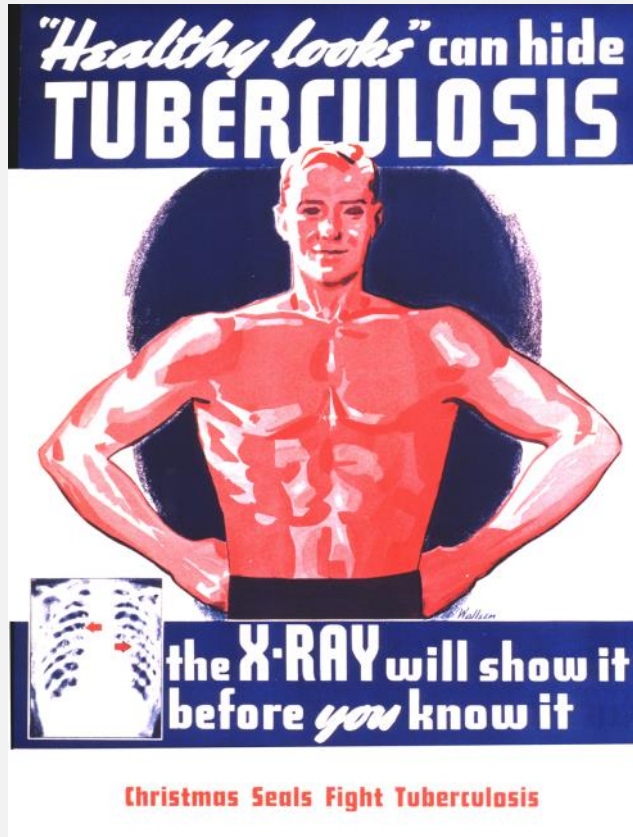


## Acknowledgements

- Professor Mike Barer and Dr Caroline Williams – University of Leicester
- Professor Anton Stoltz - University of Pretoria and Steve Biko Hospital
- Microbiology Department – Leicester Royal Infirmary
- National School of Healthcare Science
- The ACB

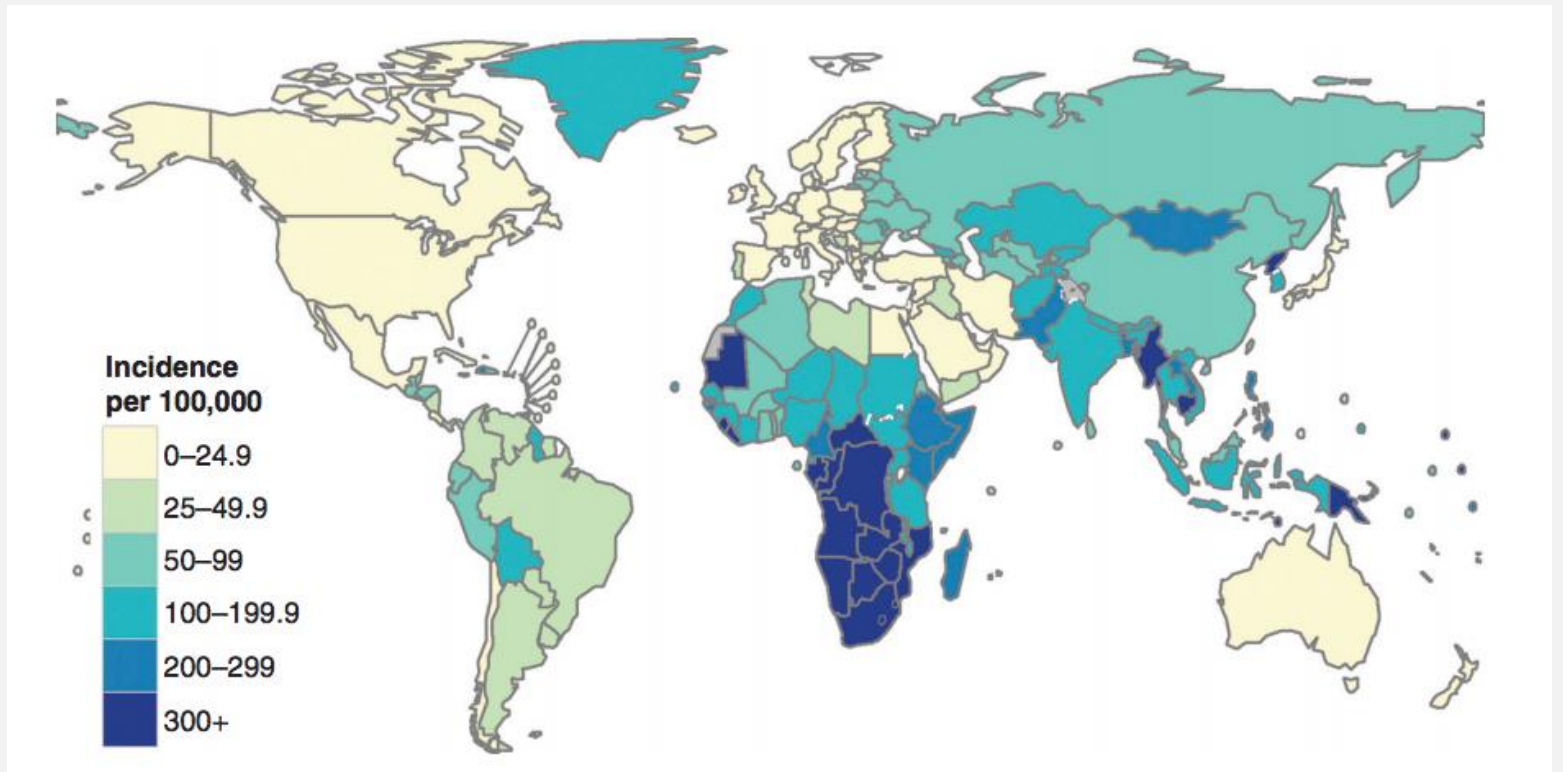


## Background – What is Tuberculosis?



# Epidemiology of Tuberculosis

- 10 million cases in 2017
- 1.6 million deaths
- Occurs worldwide
  - 25% in Africa
- 87% of cases occur in just 7 countries
  - Of which South Africa is one





## South Africa – Public Health Crisis

- 834 cases of TB per 100,000 population
- 12.6% of the population in SA have HIV
  - 7.06 million people
- Highest HIV/TB co-infection rate in the world
  - Estimated 258,000 people



## Public Health in Pretoria

- 85% with no health insurance
  - (91% are black Africans)
- Government figures claim a 83.4% treatment rate
- 66.7% cure rate
- 4.8% lost to follow up rate



What can we do about it?



## Mask Aerosol Sampling System - MASS





MASS



MASS



+



+



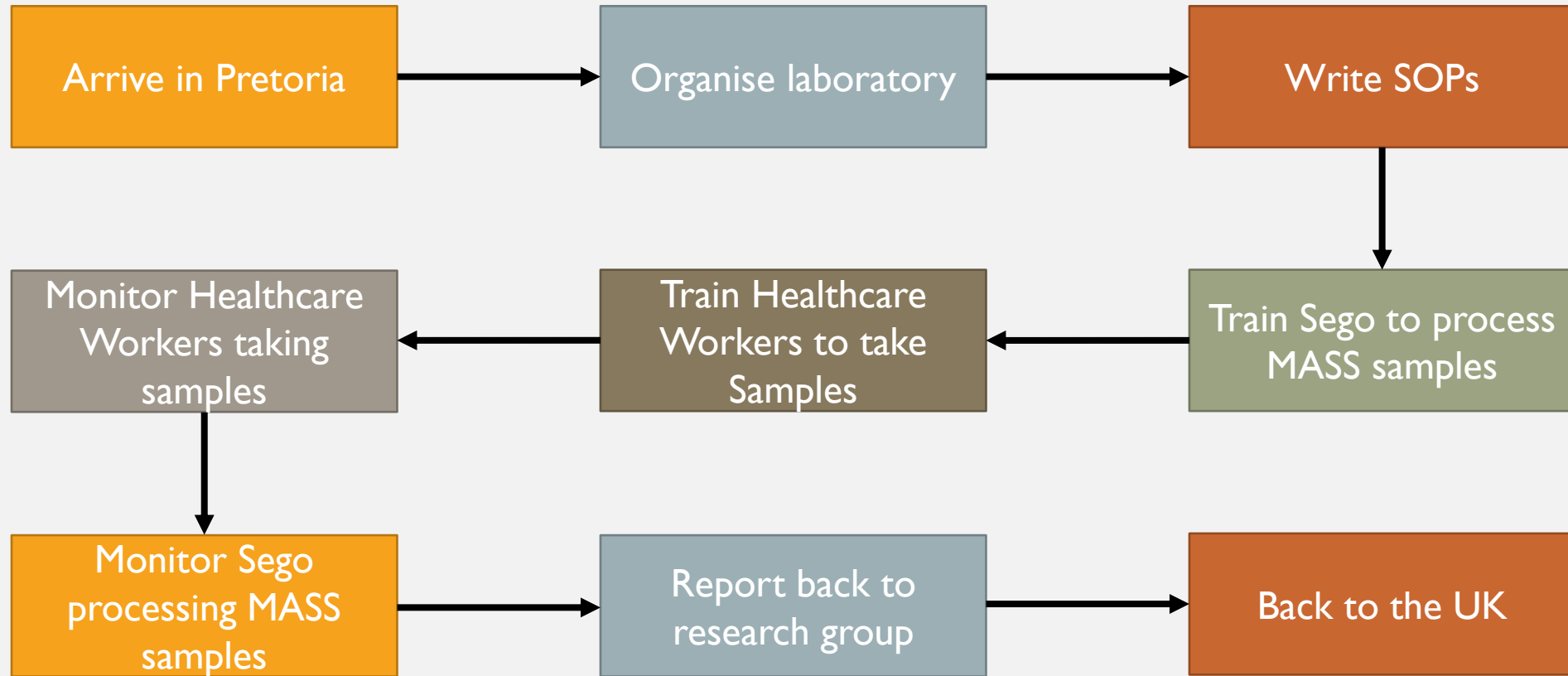
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## Elective Aims

- Set up laboratory to process MASS
- Train laboratory staff to process MASS samples
- Train community healthcare workers (CHW) to use MASS
- Test CHW for TB
- Monitor CHW taking samples
- Make links within the community to engage with MASS study

# The Plan



## Arriving in Johannesburg





# Steve Biko Hospital



# Laboratory: Before



# Laboratory After



## Training Laboratory Staff





## MRC Pretoria - Security





# Training the Health Care Workers



## Testing the Health Care Workers

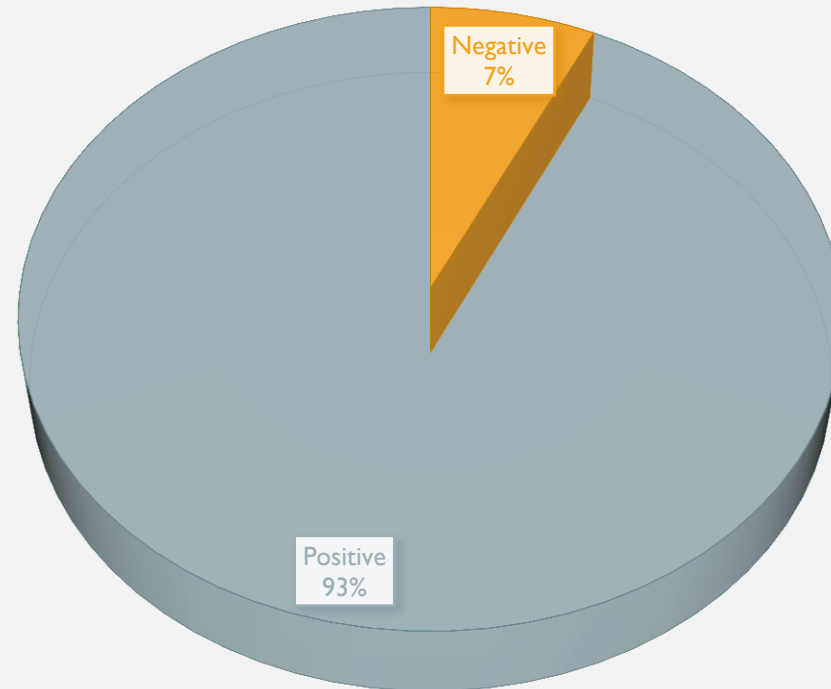




## Health Care Worker: Results

- 35 HCW tested
- First 14 were processed with a negative control and NTC
- **13/14** patient samples negative control were positive
- NTC was negative

HCW RESULTS



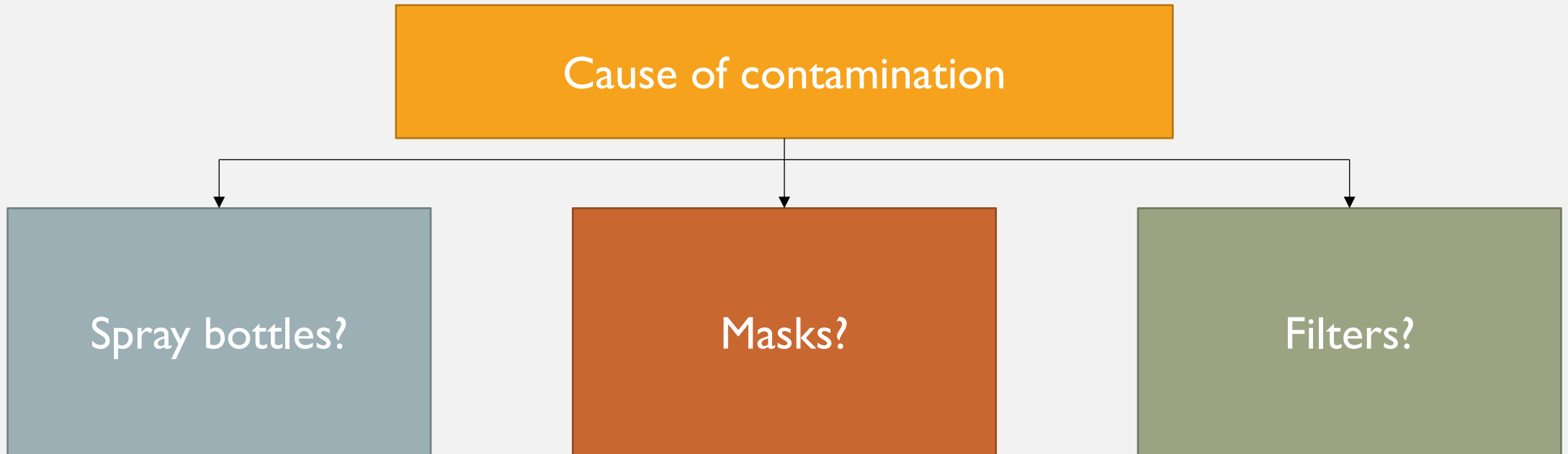
# Potential Contamination

## Cause of contamination

Spray bottles?

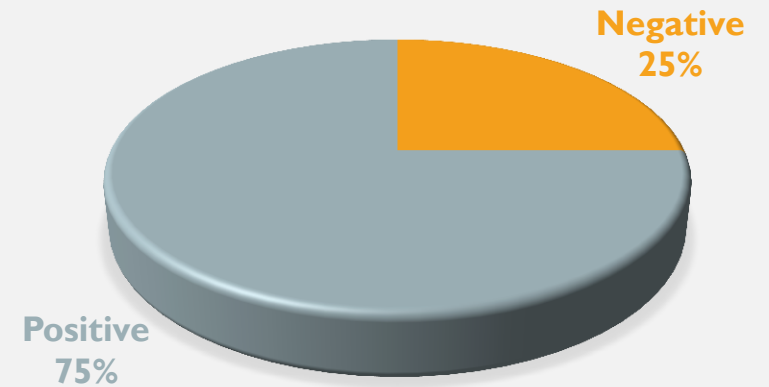
Masks?

Filters?



## Finding the Problem

- I tested 16 randomly selected masks that had been prepared in Leicester and 16 that were prepared in Pretoria.
- 9/16 prepared in Leicester were positive and 12/16 prepared in Pretoria were positive





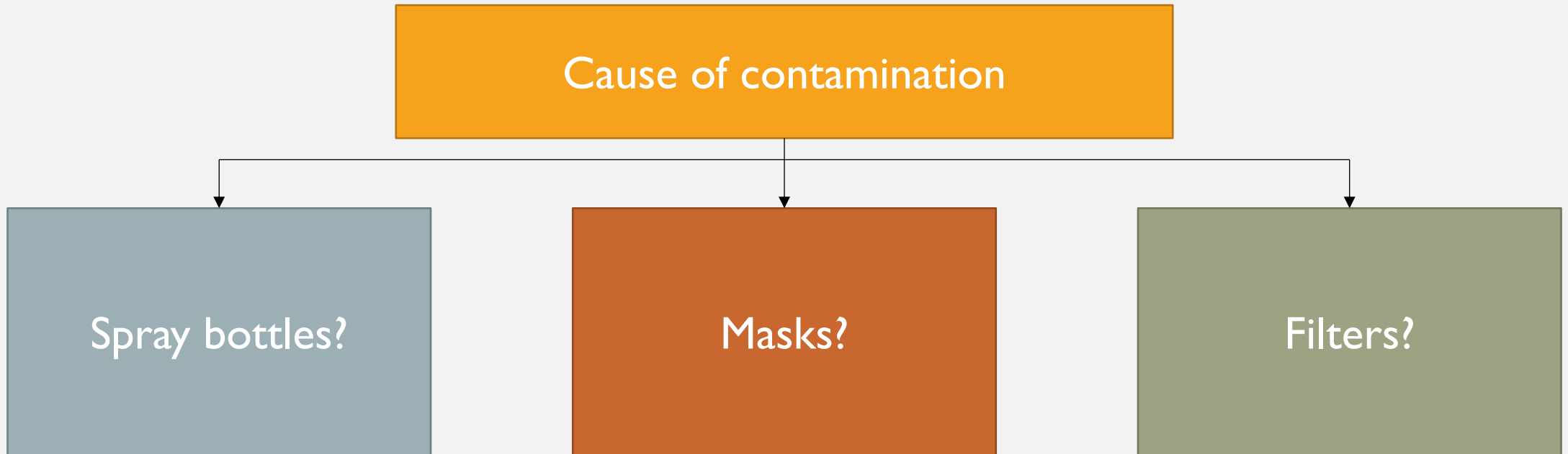
# Potential Contamination

## Cause of contamination

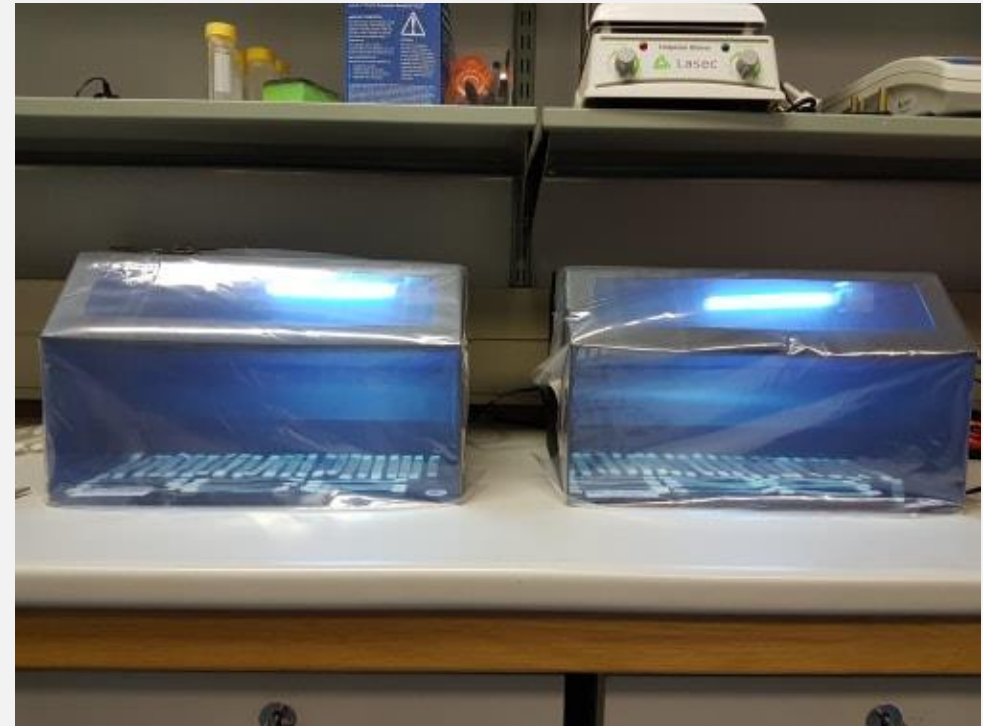
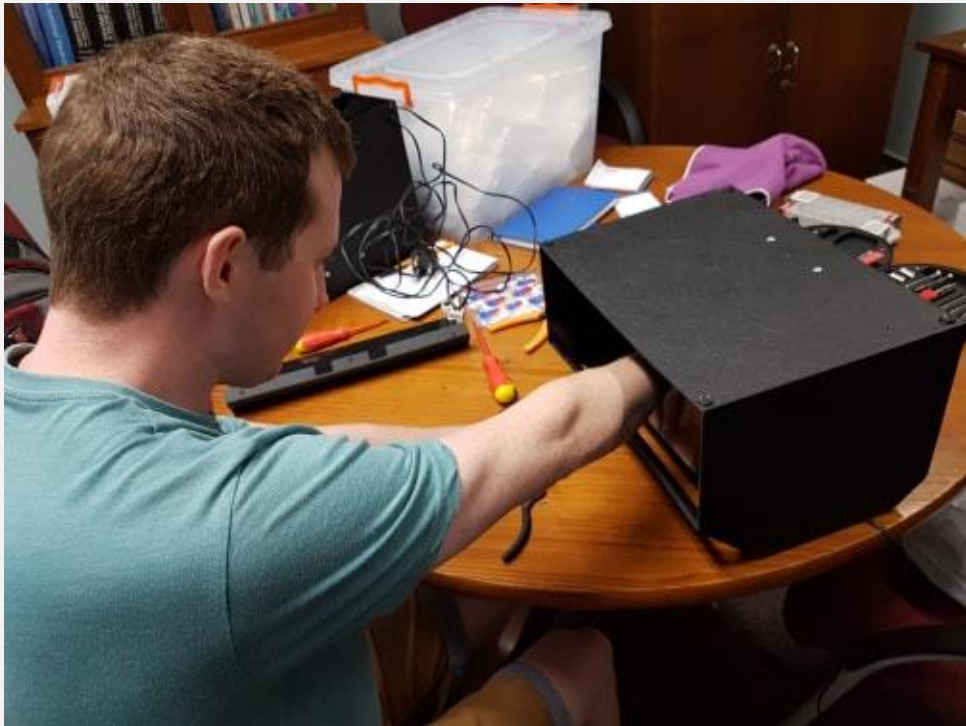
Spray bottles?

Masks?

Filters?



## Fixing the Problem

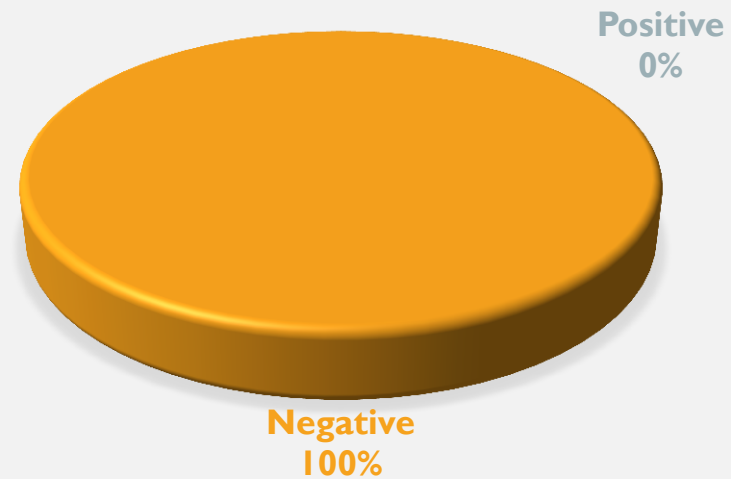


**Success!**

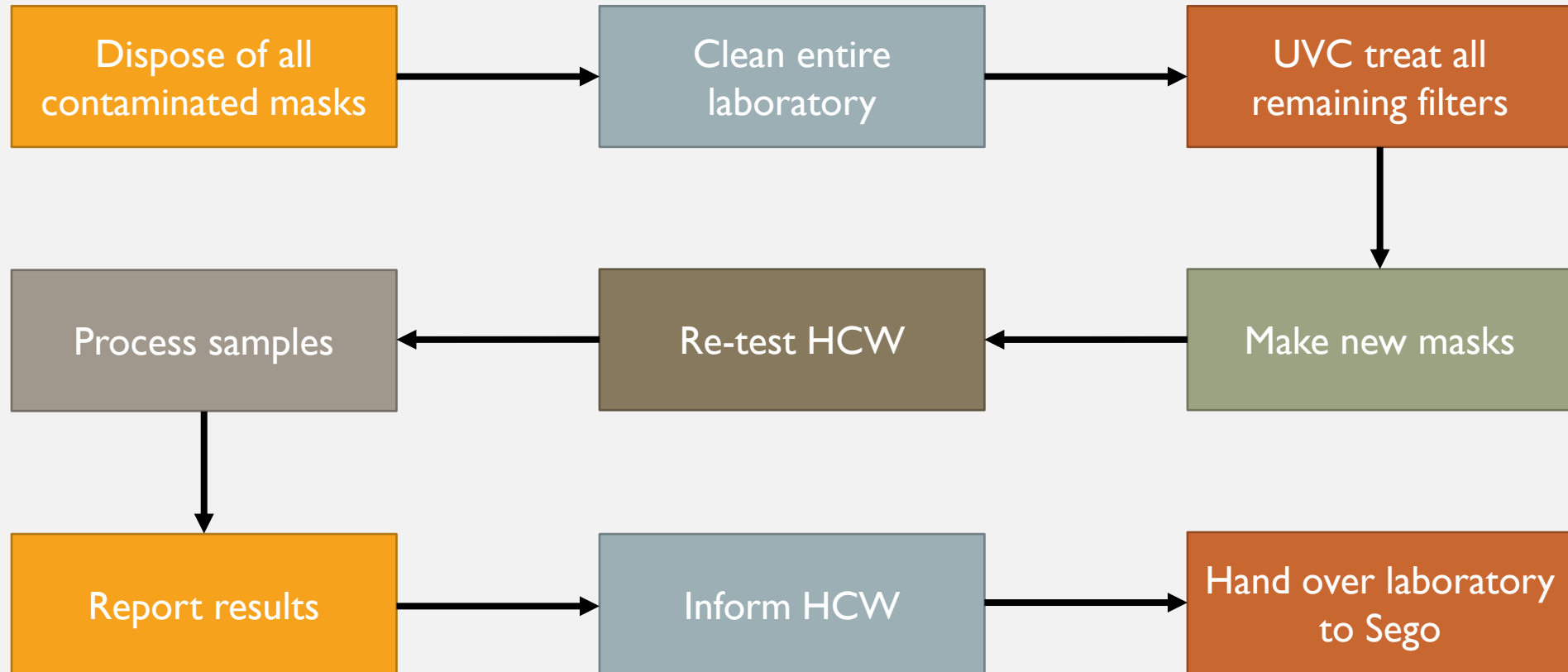
64 filters (16 masks) were UVC treated for 24 hours (12 hours on each side) and tested using the GeneXpert.

All 16 were negative for TB DNA.

### UVC Treated Filters



## New Plan



## Retesting the Health Care Workers





## Retesting the Health Care Workers Problem

### Reasons for refusing to be retested:

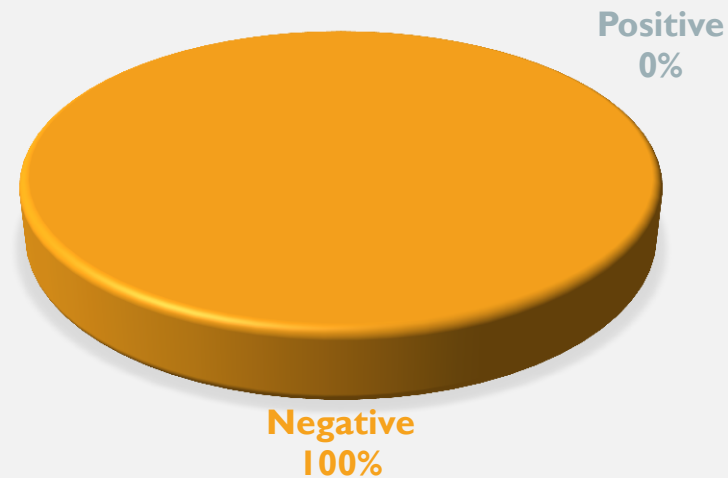
- Of the 35 original HCW only 28 returned
  - Of the 28 that returned only 10 wanted to be retested
1. Loss of feeling in lips for 7 days
  2. Loss of taste for 7 days
  3. Nose bleeds for 3 days
  4. Was unable to breathe while wearing the mask

All HCW with symptoms did not seek any medical assistance.

## Health Care Workers: Results 2

- All HCW tested were negative for TB
- Likely that those who refused may have been symptomatic and feared losing their jobs.

### HCW Results for TB



## Leaving South Africa









## Future for the Project

- Return in the New Year to:
  - Re-train HCW
  - Get into the community
  - Ramp up production and testing



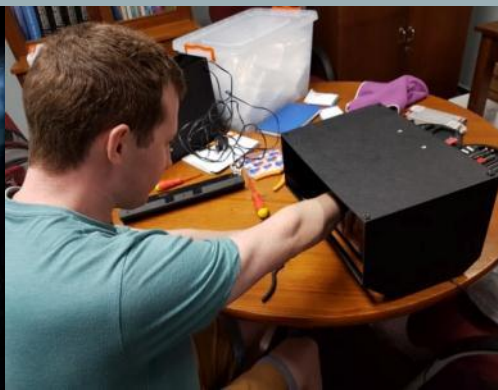
## Did we meet our aims?

- Set up laboratory to process MASS 
- Train laboratory staff to process MASS samples 
- Train community healthcare workers (CHW) to use MASS 
- Test CHW for TB 
- Monitor CHW taking samples 
- Make links within the community to engage with MASS study 



# Thank you for listening

## Are there any questions?



## References

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