



UK Health
Security
Agency

Preparing for people monitoring and using the data to inform the wider monitoring programme

Matthew Simpson, UKHSA, Internal Dosimetry
EURODOS school, June 2023

Introduction to UK People monitoring

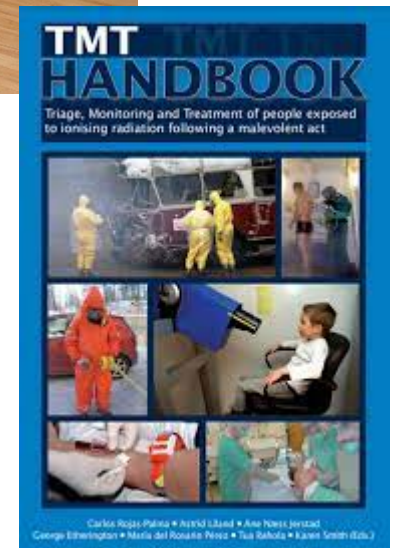
- During a large scale event where radioactivity is released, accidental or deliberate, the public require monitoring
- Monitoring is performed as part of public health thus lead by the National Health Service with support from other agencies
- UKHSA has the remit to provide the large scale people monitoring anywhere in the UK
 - Stood up if estimated to be 100's of people needing monitoring
 - Equipment and trained personnel
 - Designated the Radiation Monitoring Unit (RMU)
- Once in place all people needing monitoring will be directed to the RMU freeing up the hospitals for their core functions



Images from EDF Energy, BBC and the Express Newspaper

Radiation Monitoring Unit

- Designed to be fully functional within 24-hours
- Provides both reassurance monitoring and appropriate support and advice to those unfortunately contaminated
- Scalable up to about 1000 people per day
- Setup in 4 stages – Triage, External, Internal and Dispersal
- Utilise IAEA and European suggested Action Limits



RMU Stages – 1 (external triage)



- Using a portal system
 - Walk through model to hit about 37kBq Cs137 equivalent – preferred option
 - Dwell for up to 15 seconds to hit 1-5 kBq Cs137
- Mainly a tool for triage, is decon needed immediately?
- No alarm set, just a trigger level for the operators to use
 - Need to manage public anxiety
- Management of contamination to prevent location and equipment getting contaminated
- Only works for Beta/Gamma

RMU Stages – 2 (external detailed scan)



- Hand held monitoring using appropriate instrument
 - Deployment should have alpha, beta and gamma
- Looking for more detailed examination of individual
 - Top of head, face, hands, bags, feet etc.
- For Beta/Gamma takes a few minutes
- For Alpha take at least 5 minutes
- Trigger levels for decontamination
- Management of contamination to prevent location and equipment getting contaminated



RMU Stages – 3 (internal)



- Only needed for individuals who required decontamination
- Thyroid or Whole Body using large NaI
 - 2mSv trigger point covers adults and children
- Second part uses portable HPGe to estimate activity and all nuclides present
- Request to provide 24hr (or 1L) urine sample
- Individual not provided dose directly, information will be passed to medical professionals to ensure correct support provided



RMU Stages – 4 (dispersal)

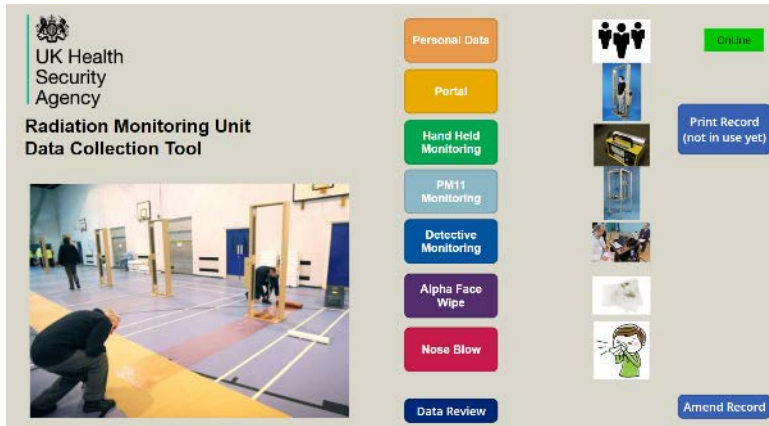


- Area to get welfare support
 - Hot drink and a biscuit
 - Minor medical support
- Individuals provided information around what has happened and what to do now
- Directed to go home/hospital depending on outcomes of monitoring
- Details fully recorded for any individual who did have contamination

Images provided by Liverpool and Surrey local authorities in the UK

Data collection

- Collected electronically with a paper backup
- Used to assess external contamination and internal doses to individuals
- Results provided to medical staff to offer suitable treatment, support and advice
- Protection of individuals data – legal requirement



The screenshot shows the 'Hand Held Instrument Assessment' form. It includes a body diagram with numbered points (1-17) for measurement locations. The form fields include: ID or Barcode Number*, Instrument Used* and nuclide*, Background Reading*, Measurement, Body Position, Front or back, and Reading. There are 'Clear Data' and 'Save Data' buttons, and a 'Help' button. A message at the bottom states 'The Required data * is still needed'.

The screenshot shows the 'Whole Body PM11 measurement' form. It includes a photo of a person in a measurement chamber. The form fields include: ID or Barcode Number*, Age range* (0-2 years, over 2 years), Background Counts*, Background Count Time*, Nuclide*, Measurement Count*, and Measurement Count Time*. There are 'Clear Data' and 'Save Data' buttons, and a 'Help' button. A message at the bottom states 'The Required data * is still needed'.

Data manipulation

- In Field dose calculations made using approximate/generic parameters
 - Inhalation, normal breathing, 5 μ m AMAD, lung solubility M, Adult
- At Emergency Centre more information is used to better calculate
 - Inhalation/Ingestion, particle size, chemical form, age etc.
 - Modelling software



Decontamination for the public

- UK Media messaging ‘Remove, Remove, Remove’
 - Covers any contamination even
 - Best thing to do is get away, remove it as quick as possible, and then wash
- It will likely spread the contamination however the benefits to the individual are greater than the impact of the spread



REMOVE THEMSELVES...
...from the immediate area to avoid further exposure to the substance. Fresh air is important.
If the skin is itchy or painful, find a water source.
REPORT... to the emergency services.

REMOVE OUTER CLOTHING...
...if affected by the substance.
Try to avoid pulling clothing over the head if possible.
Do not smoke, eat or drink.
Do not pull off clothing stuck to skin.

REMOVE THE SUBSTANCE...
...from skin using a dry absorbent material to either soak it up or brush it off.
RINSE continually with water if the skin is itchy or painful.

Decontamination for the public

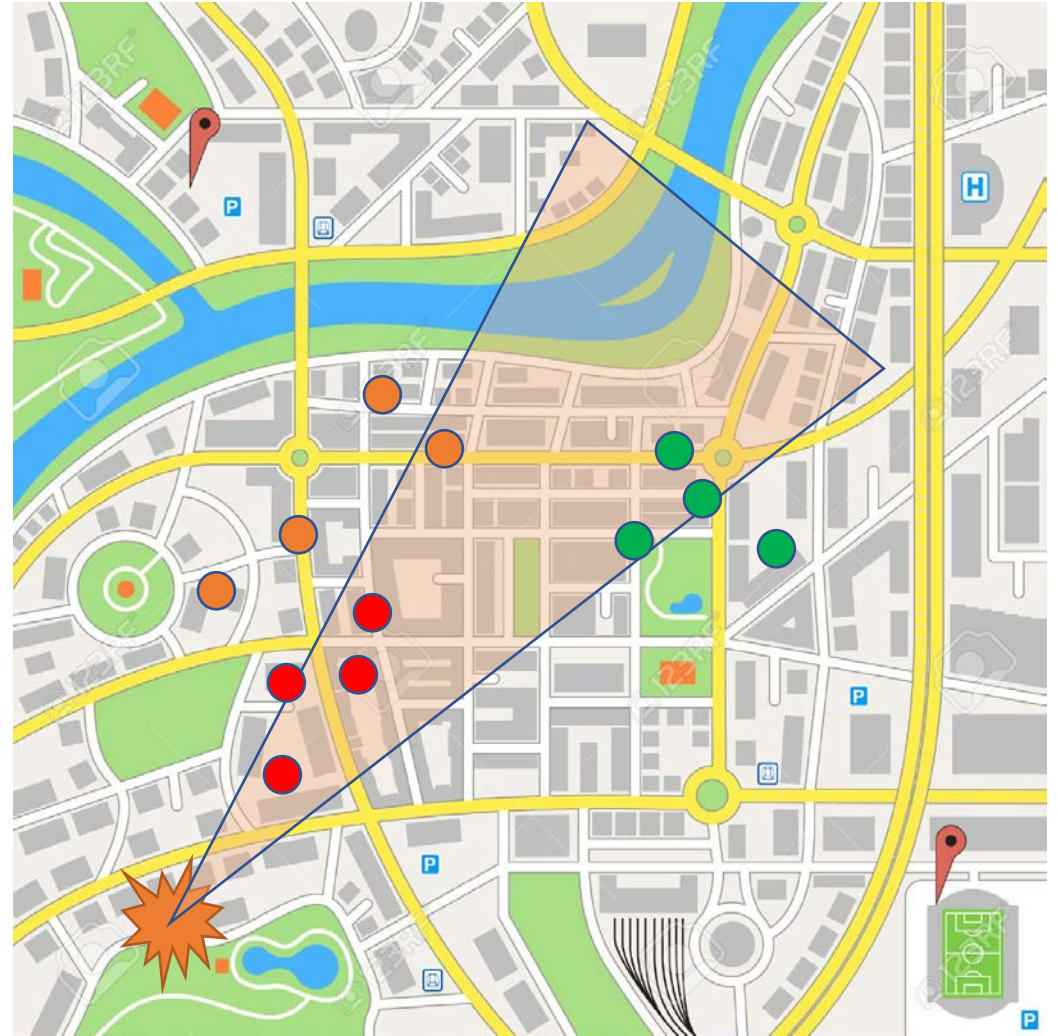
- Individual and 'buddy' decontamination
 - Wipes and tissues
 - Useful while waiting for mass decontamination facilities or monitoring
- Mass decontamination
 - Large scale provided by emergency services
 - Will take time to setup
 - Usually a mass showering capability with replacement clothing
 - Waste management is required



Image courtesy of Northamptonshire Fire and Rescue Service

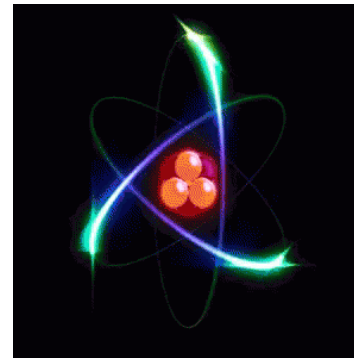
Using live people monitoring data

- Urban dispersal is not always driven by wind direction but also topography and buildings
- Monitoring data here indicates that contamination is spread more to the north than the standard plume model would suggest
- Ability to target population better using the live data



Summary

- The Radiation Monitoring Unit is setup in response to a large scale radioactive material release to monitor the public
- External monitoring allows people to then be sent home or be decontaminated and further monitored
- Once externally clean they can be assessed for internal contamination and receive the support needed for this



Questions?