



The Operation TOMODACHI Registry and Population Parameters for the DARWG Initial Upper Bound Dose Report



Brief for: Veterans' Advisory Board on Dose Reconstruction
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- My co-authors: CDR Cassata, USN, Dr. Rademacher, LTJG Alleman, USN, LTC Rosser, USA, Mr. Dunavant, Dr. Case, & Dr. Blake.





Overview



This presentation will briefly introduce the Operation TOMODACHI Registry and then focus on the population parameter values used to calculate credible upper bound radiation doses.



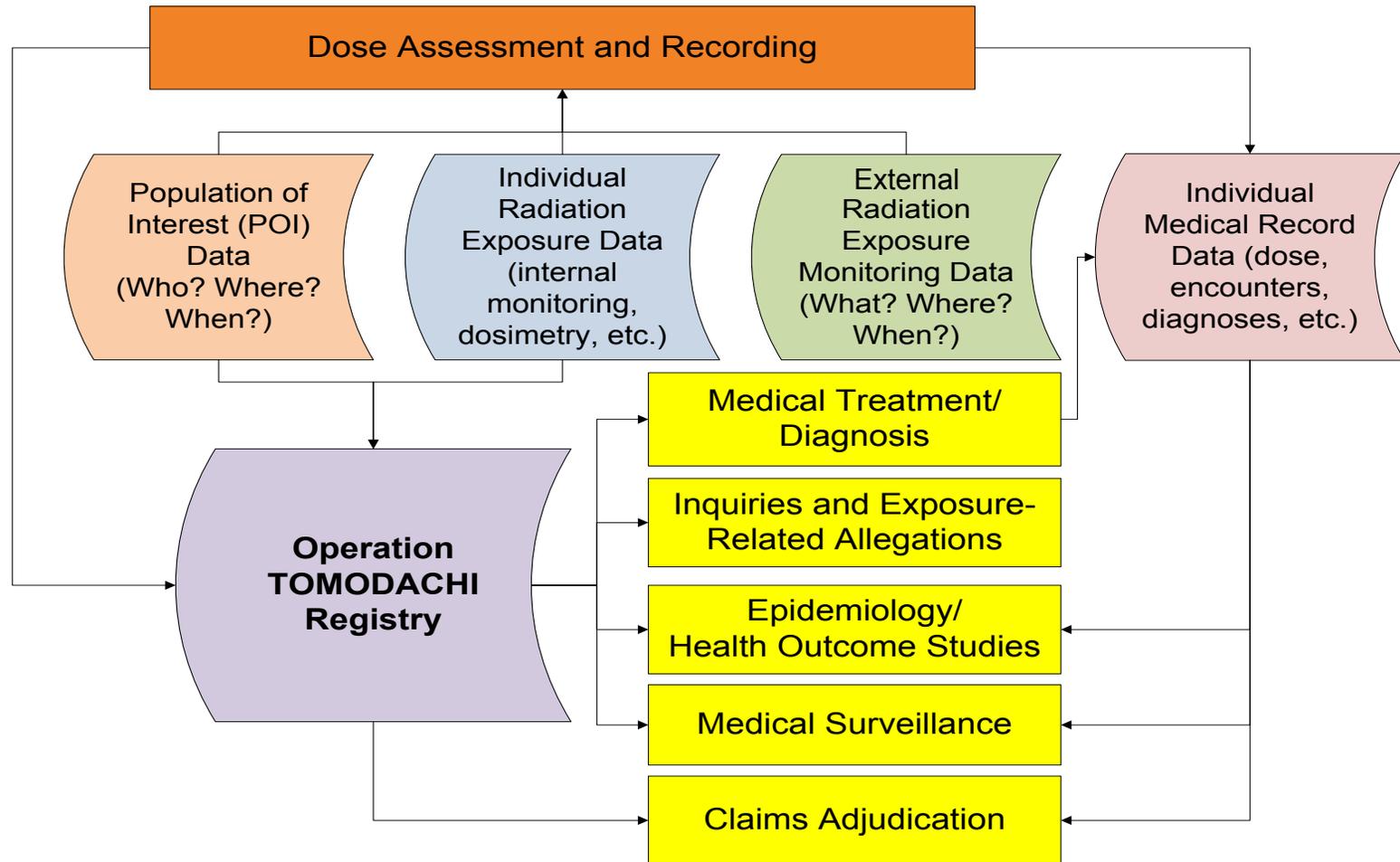
Outline



- Operation TOMODACHI Registry (OTR)
- Population of Interest (POI)
- Potentially Exposed Populations (PEPs)
- Habit Data (Lifestyle Parameters)
 - Time Spent Indoors
 - Inhalation Rates
 - Ingestion Rates
- OTR Development

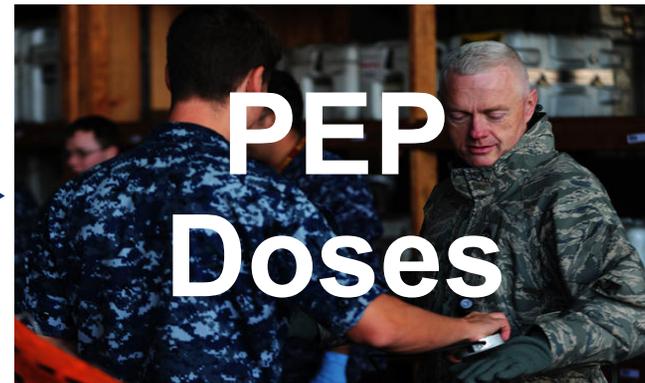


Operation TOMODACHI Registry





Conceptual Process





Population of Interest



The population of interest (POI) is “DOD-affiliated personnel associated with the Japan earthquake, tsunami, and resulting radiation situation.” For the registry, this is about 68,000 people and only the timeframe of 12 March to 11 May 2011 is considered.



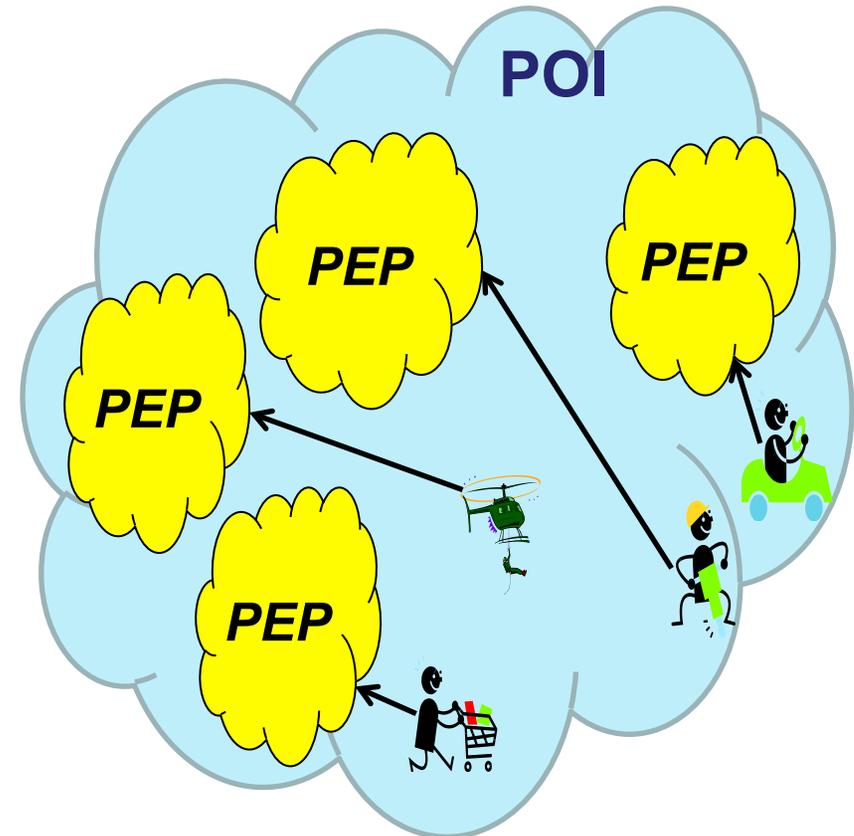
Potentially Exposed Populations (PEPs)



Subpopulation of defined by a common location, age, and habit data.



- Example: Adults who live and work on an installation.
- Conceptually, a PEP can be considered an “opportunity for exposure.”





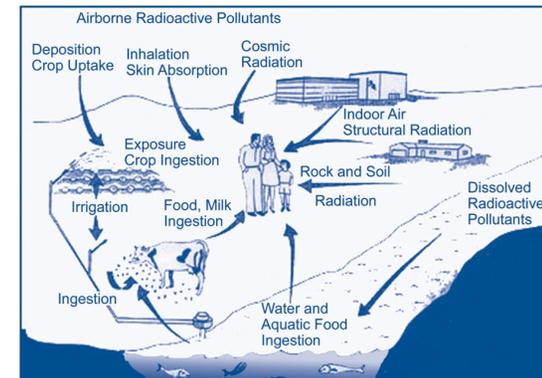
Habit Data



Data considered - function of age and physical activity level (PEP Category)



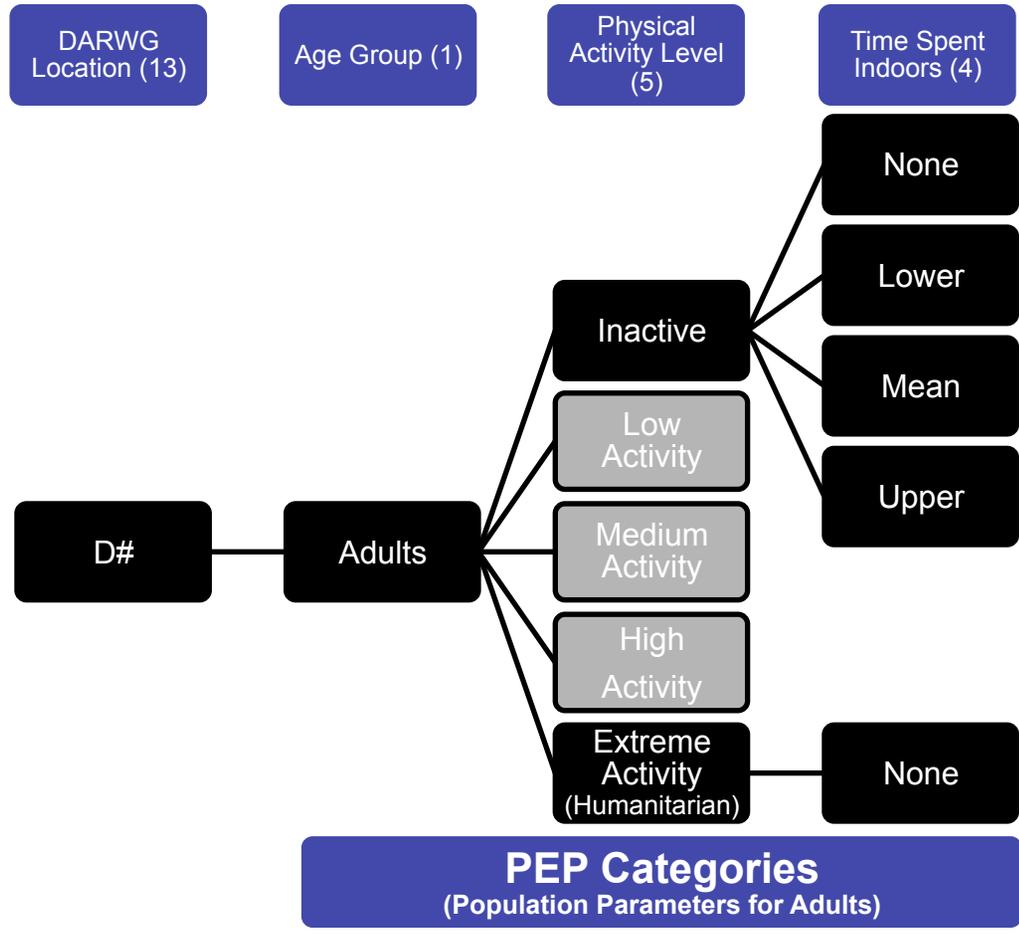
- Time spent indoors
- Inhalation rates
- Drinking water ingestion rates
- Soil and dust ingestion rates
- Food ingestion determined not to be significant



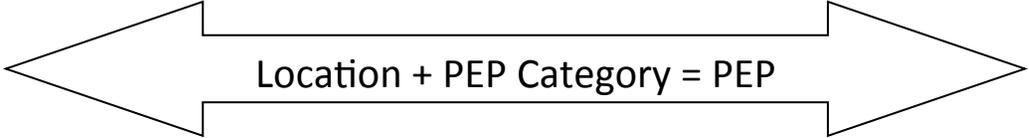
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Adult's PEP Schematic

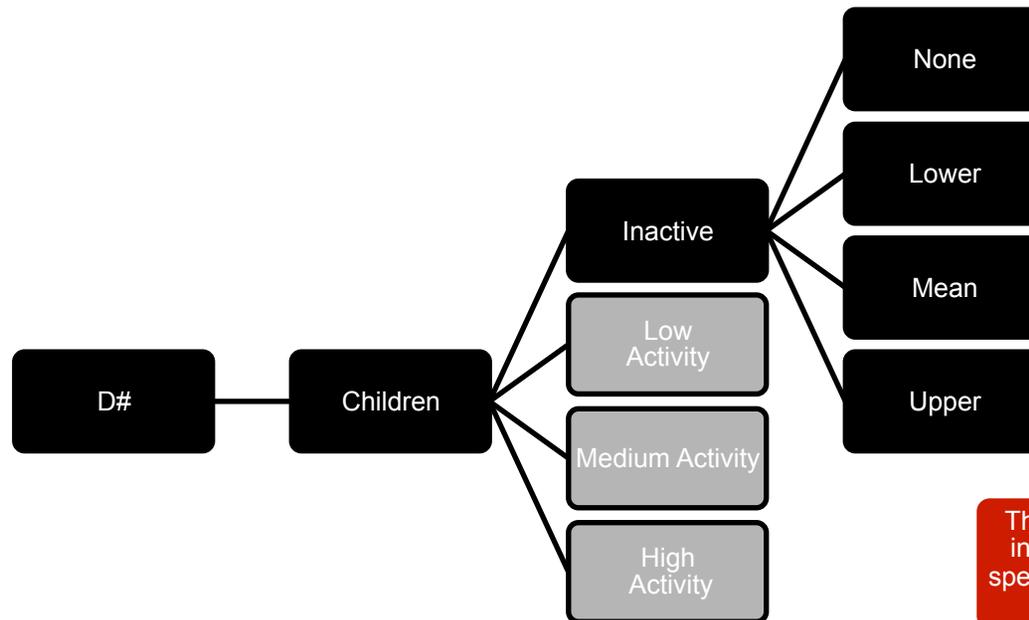
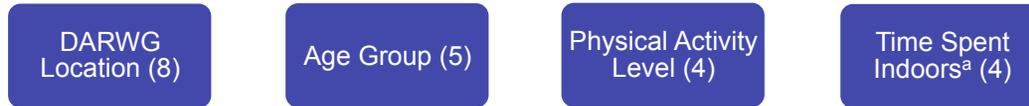


The grayed out boxes indicate that the time spent indoor boxes were left out for clarity.



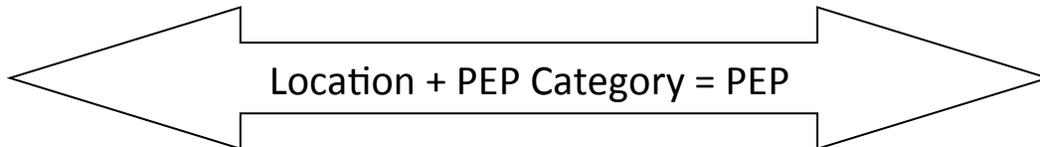


Children's PEP Schematic



The grayed out boxes indicate that the time spent indoors boxes were left out for clarity.

PEP Categories
(Population Parameters for Children)
^aAssumed time spent indoors depends on age





PEP Age Groups



	<u>ICRP</u>	<u>USEPA</u>
Age	Age Group	Age Group
3 mo	0 to 1 y	Birth to <1 mo 1 to <3 mo 3 to <6 mo 6 to <12 mo
1 y	>1 y to 2 y	1 to <2 y
5 y	>2 y to 7 y	2 to <3 y 3 to <6 y
10 y	>7 y to 12 y	6 to <11 y
15 y	>12 y to 17 y	11 to <16 y
Adult	>17 y	16 to <21 y 18 to <65 y >65 y



Time Spent Indoors



USEPA

Time Spent Indoors (minutes per day)

Age Group	Zero	Lower	Mean	Upper
Birth to <1 mo				
1 to <3 mo				
3 to <6 mo	0	579	1108	1440
6 to <12 mo				
1 to <2 y	0	579	1065	1440
2 to <3 y				
3 to <6 y	0	523	957	1296
6 to <11 y	0	458	893	1275
11 to <16 y	0	415	889	1315
16 to <21 y				
18 to <65 y	0	330	833	1288
>65 y				



Inhalation



Breathing Rates (m³ d⁻¹)



ICRP Age	Inactive	Low Activity	Medium Activity	High Activity	Extreme Activity (Humanitarian)
3 mo	3.69	4.22	4.75	9.2	NA
1 y	4.53	5.12	5.71	12.8	
5 y	7.81	8.64	10.21	13.8	
10 y	9.25	10.59	11.94	16.6	
15 y	14.75	17.23	19.70	21.9	
Adults	15.59	15.59	19.38	30	32



Drinking Water Ingestion



Drinking Water Ingestion Rates (L d⁻¹)



ICRP Age	Inactive	Low Activity	Medium Activity	High Activity	Extreme Activity (Humanitarian)
3 mo	0.384	0.612	0.851	1.2	NA
1 y	0.159	0.294	0.481	0.89	
5 y	0.255	0.442	0.682	1.0	
10 y	0.310	0.506	0.805	1.4	
15 y	0.404	0.665	1.105	2.8	
Adults	0.939	1.345	1.877	4	6



Soil + Dust Ingestion



Soil Ingestion (mg d⁻¹)



ICRP Age	Inactive	Low Activity	Medium Activity	High Activity	Extreme Activity (Humanitarian)
3 mo	16.8	60	200	1000	NA
1 y	16.8	100	200	1000	
5 y	16.8	100	200	1000	
10 y	16.8	100	200	1000	
15 y	16.8	100	200	1000	
Adults	16.8	100	200	200	500



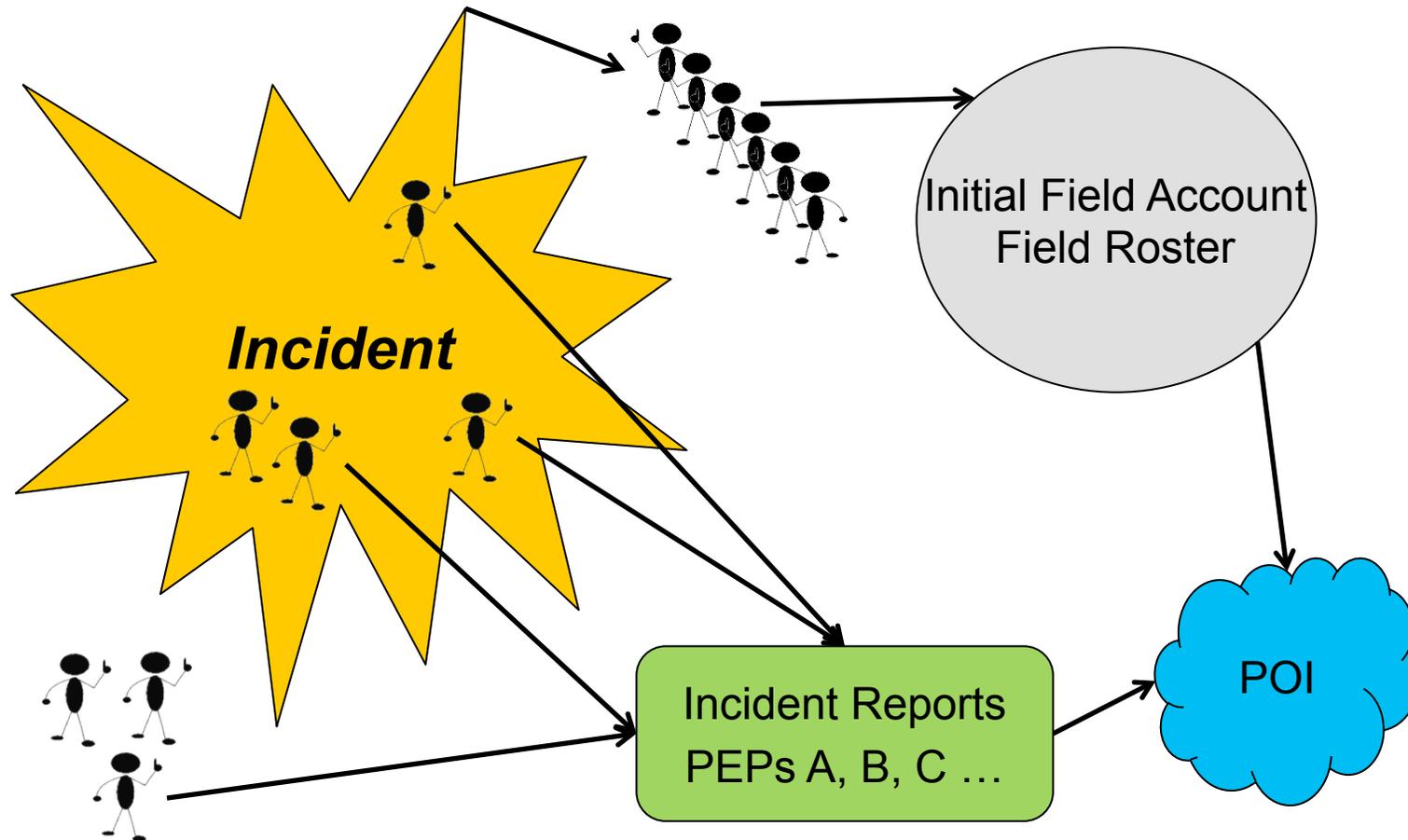
OTR Development



- The OTR will be developed within the Defense Occupational and Environmental Health Readiness System (DOEHRS)
- Existing DOEHRS functionally that enable doses to be associated to individuals and populations
- Expand DOEHRS capability to:
 - Include DOD family members
 - Link individual and population based doses
 - Interface with a publicly accessible web site
 - Manage individual inquires from beneficiaries.



How DOEHRS Derives a POI





Questions
or
Comments?