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The United States Transuranium and Uranium Registries Health Physics Database

Learning from Plutonium and Uranium Workers

Scientific Advisory Committee Update: 2026

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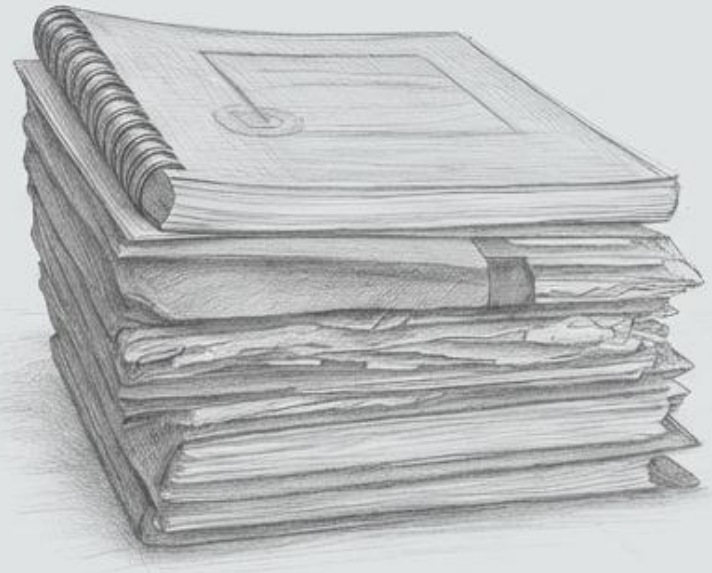
Transforming historical paper legacies into a standardized, searchable research engine.

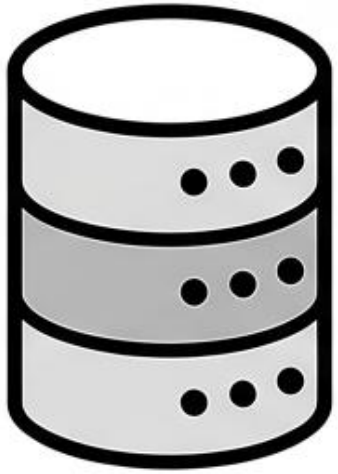
The Physical Legacy



Tens of thousands of paper records obtained from national laboratories with Registrant permission.

The Digital Objective

- Exposure incidents
- Treatment
- Bioassay data



- Internal dose assessments
- External dose

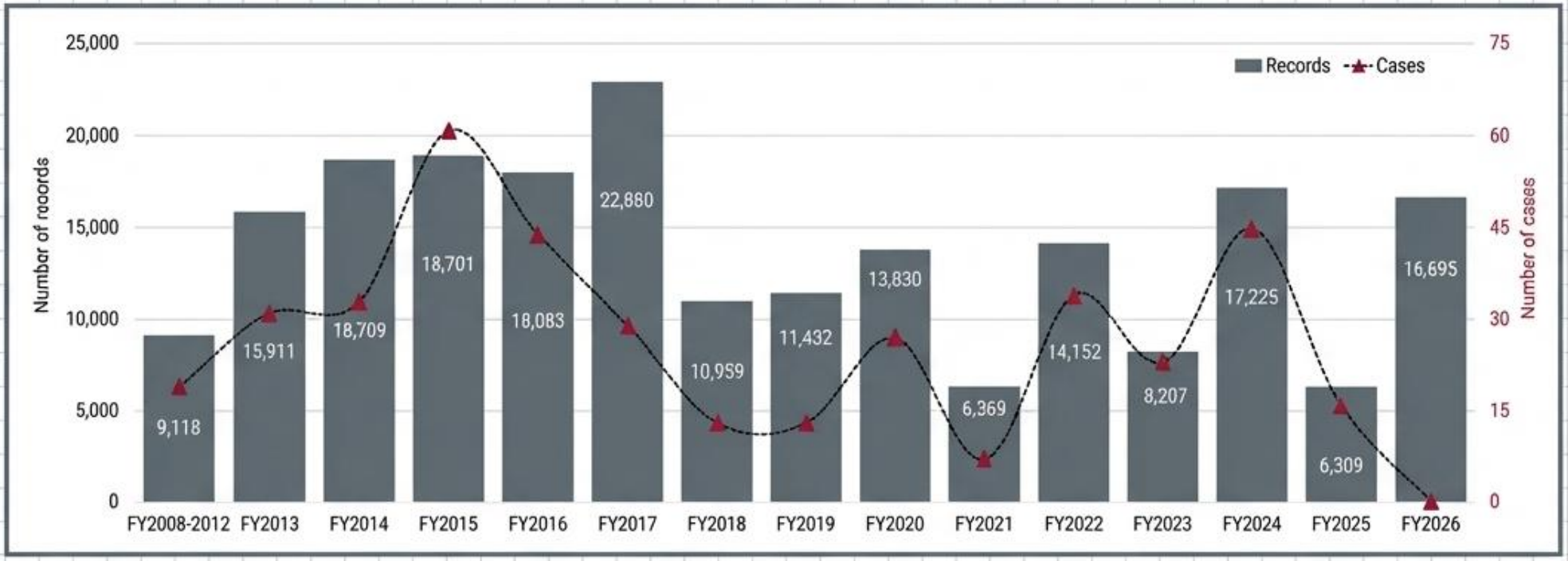
Designed to make data available for research

Nearly two decades of sustained data entry yields over 208,000 digitized records.

395 Total Cases

52 whole-body, 332 partial-body, and 11 special study cases

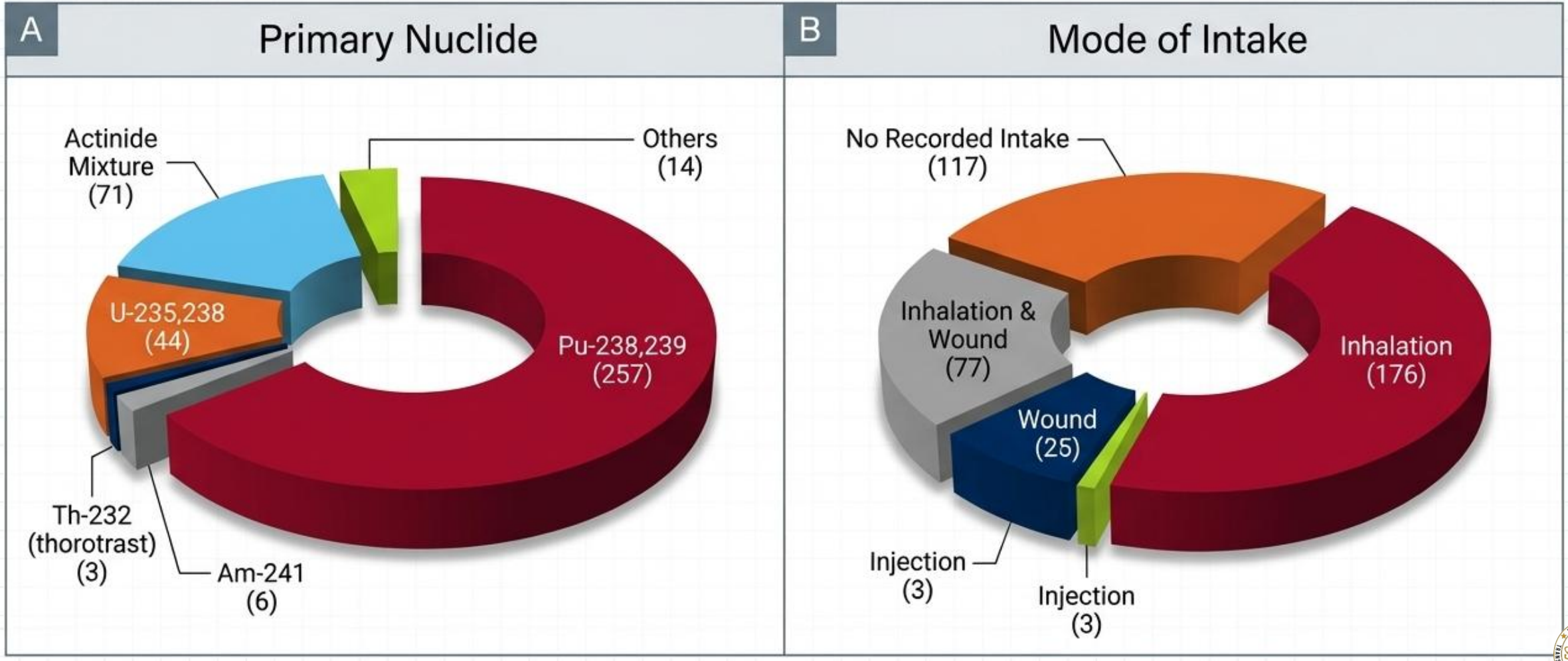
208,836 Total Records



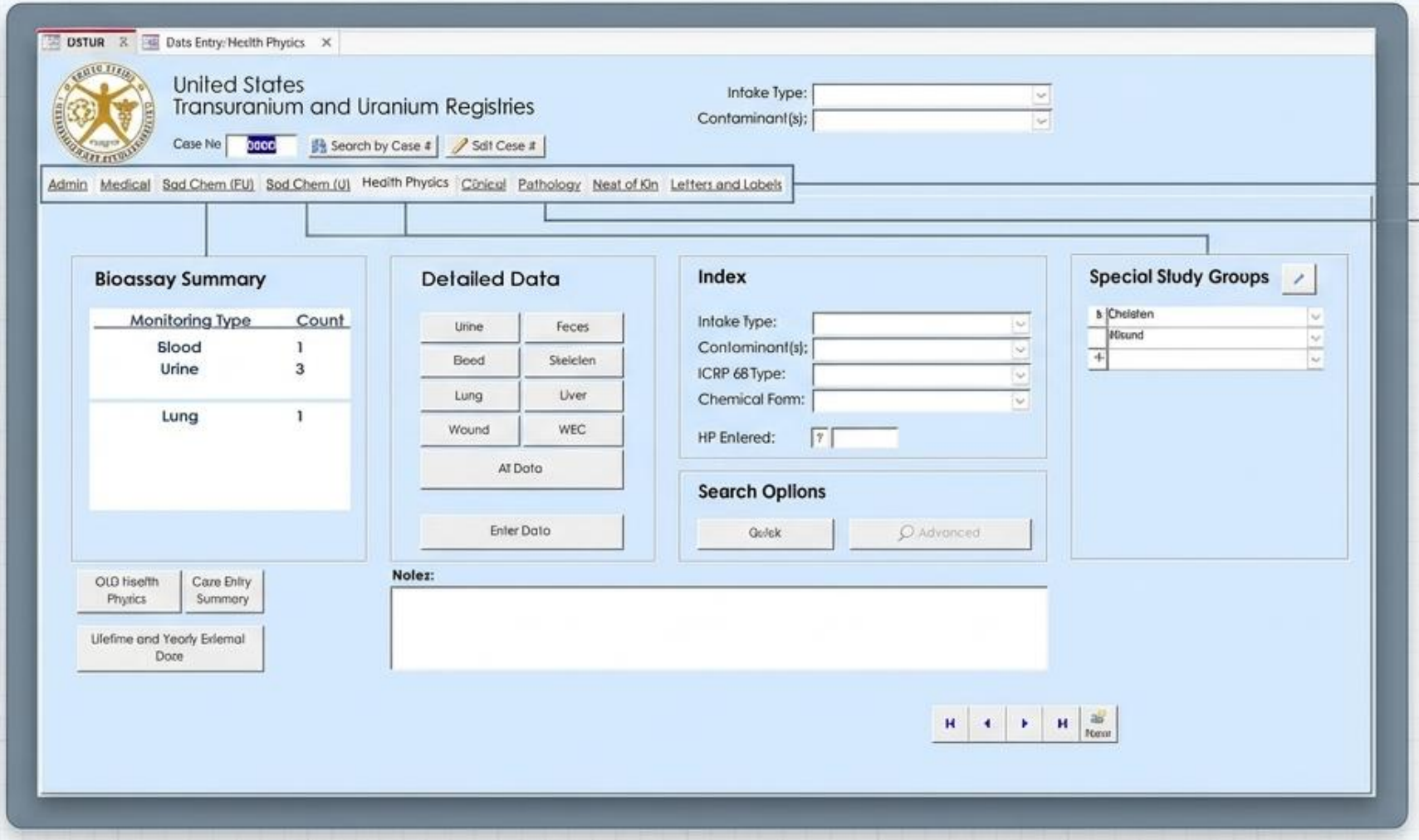
Status

- Systematic database population started
- All existing data entry completed!
- Missing data obtained and currently in progress

Plutonium inhalation represents the primary exposure profile within the registry.



Eight standardized tabs govern the categorization of decades of specialized health physics data.

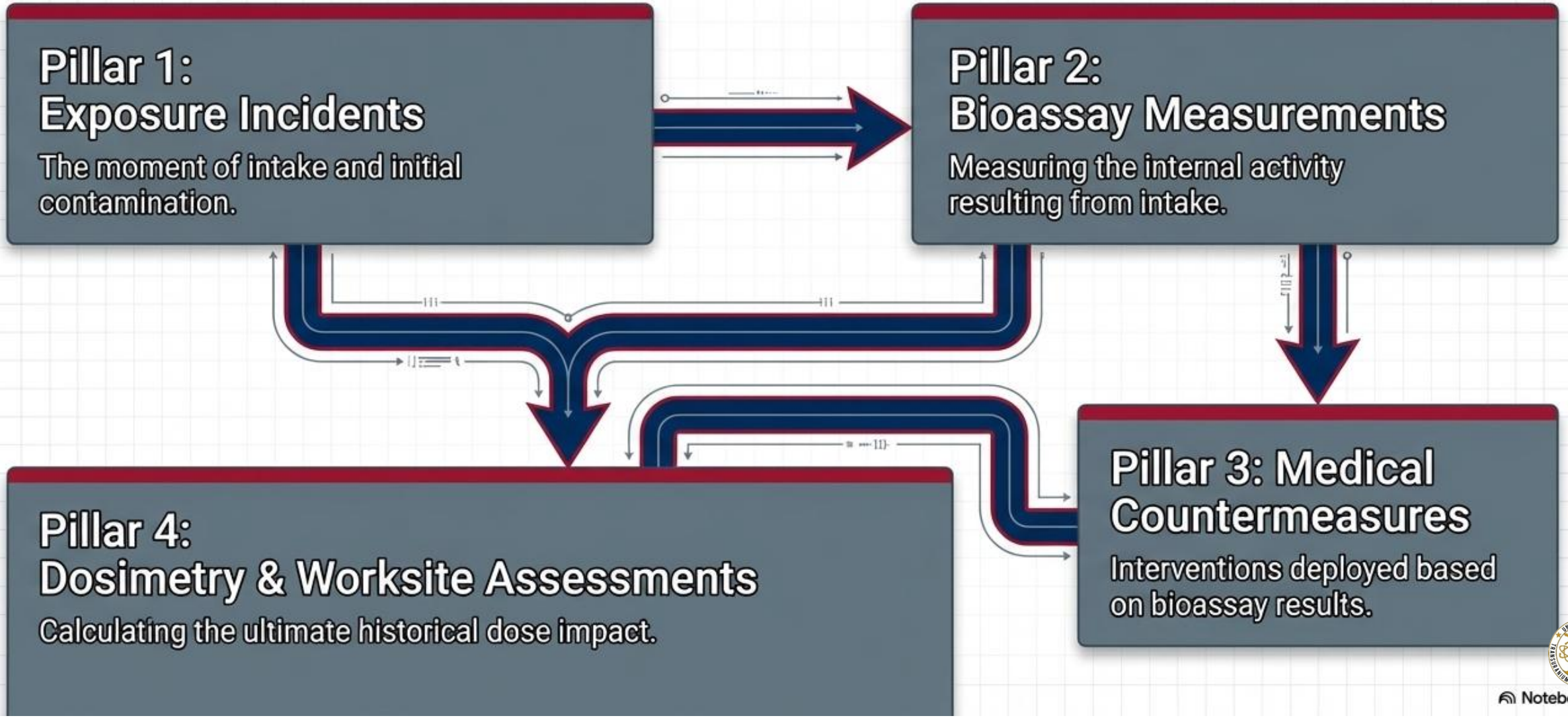


HEALTH PHYSICS DATABASE MANUAL

The Health Physics Database Manual enforces strict data entry guidance and standardizes architecture across eight core modules:

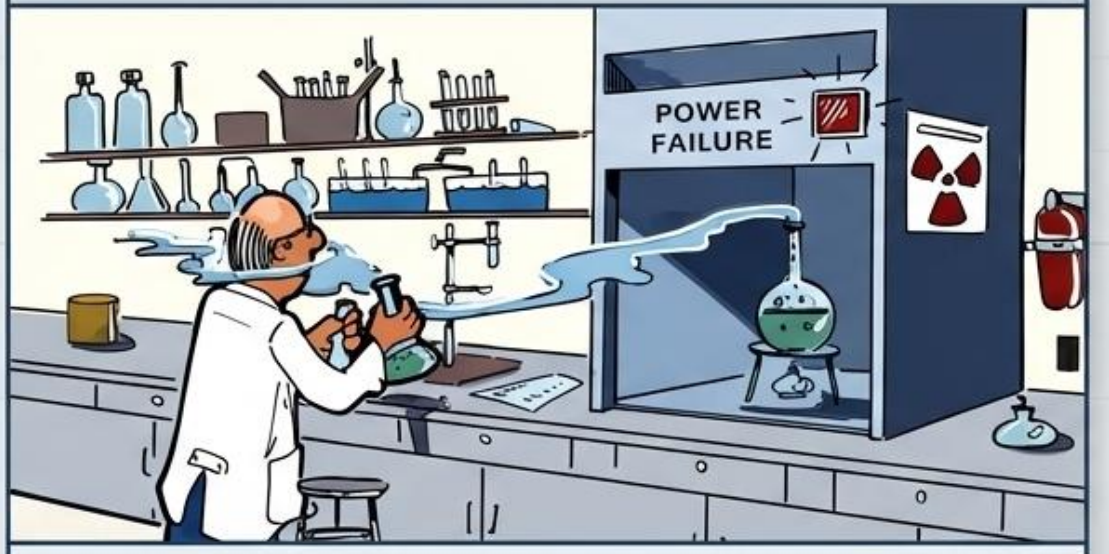
- **Incidents**
- **Contamination**
- **In Vitro**
- **In Vivo**
- **Air Monitoring**
- **Work Site Assessments**
- **External**
- **Treatment**

The framework integrates four interconnected pillars of a worker's exposure lifecycle.



Pillar 1 documents the specific parameters of the exposure incident and initial contamination.

Inhalation / Airborne Incidents



- Air sample data
- Exact date, time, and location
- Detailed incident narrative

Wounds / Direct Contact Incidents

- Contamination levels (personal, clothing, workplace)
- Known material characteristics
- Associated fire or explosion parameters

Pillar 2 captures highly specific internal monitoring data across two primary bioassay methodologies.

In Vitro Bioassay

Sample Mediums:	Urine, feces, blood, nasal smear
Tracked Variables:	Sample type (e.g. 24-hr), total volume / mass
Source:	Laboratory measurement methods

In Vivo Bioassay

Scan Targets:	Lung, liver, skeleton, whole-body, wound
Physiological Variables:	Body index, chest wall thickness
Source:	Detector type and material composition (e.g., ppm Am)

Shared Data Requirements:
Measured Activity, Uncertainty, and Minimum Detectable Activity (MDA)

Pillar 3 records the specific medical countermeasures deployed to reduce internal body burden.

Mechanical: Wound Treatment

Procedures Tracked:
- Excision events
- Irrigation treatments

Crucial Metric:
- Total activity removed

Chemical: Chelation Therapy

Treatments Tracked:
- Chemical Agents: Ca/Zn-DTPA, Ca-EDTA
- Administration Modality: Intravenous (i.v.), Intramuscular (i.m.), Oral

Crucial Metric:
- Exact dosage administered

Pillar 4 synthesizes internal model assumptions with historical external dosimeter readings.

Work Site Assessments

Internal Dose Metrics:

- Recorded Intake
- Calculated Body Burden
- Assigned Effective Dose

Contextual Data: Basis for calculations (urinalyses, lung counts) and historical worksite model assumptions.

External Dose Tracking

Physical Tracking Metrics:

- Recorded Measurement Quantity
- Measurement Period: Interval, Annual, or Lifetime
- Specific Dosimeter Type worn

Record volume varies dramatically by worksite, with Hanford dominating external dose and bioassay histories.

	Rocky Flats	Los Alamos	Hanford
Incidents/Contamination/Air	17 / 8 / 2	11 / 0 / 1	52 / 84 / 16
In Vitro Bioassay	233	10	467
In Vivo Bioassay	229	3	73
Worksite Assessments	9	1	117
Treatment (chelation, excision)	5	0	6
External dose	319	147	1,195
TOTAL	822	173	2,010

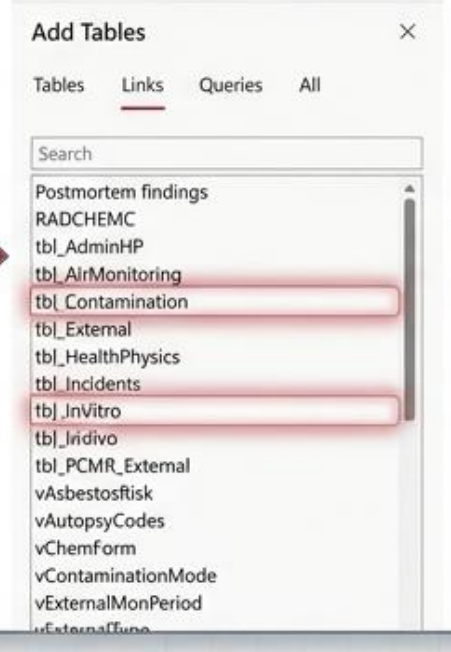
Structured table architecture enables granular, cross-referenced queries for specific research criteria.

1. INITIATION

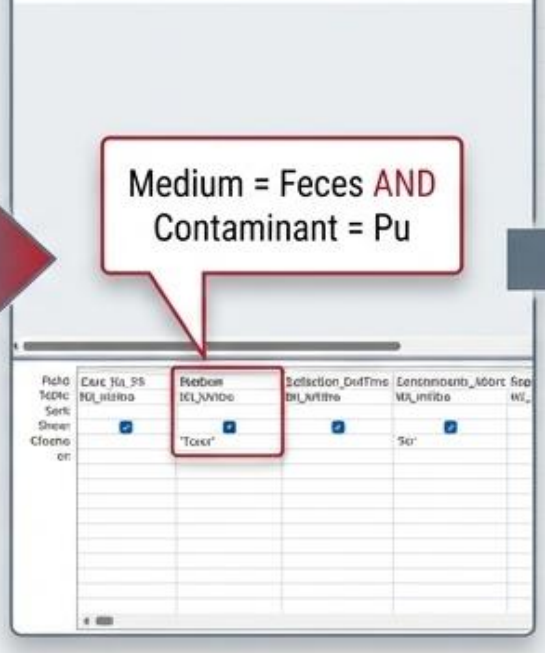
DATABASE QUERY

```
SELECT * FROM TABLE
WHERE column = value
```

2. TARGET SELECTION



3. PARAMETER FILTERING

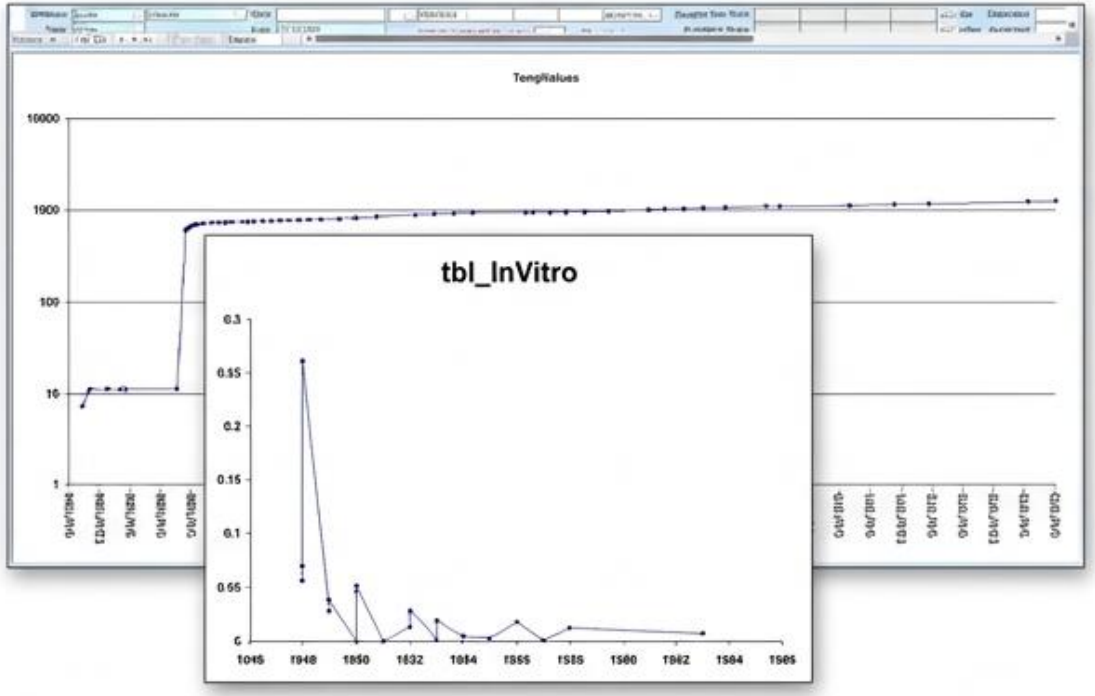


4. EXTRACTION OUTPUT

NotebookLM

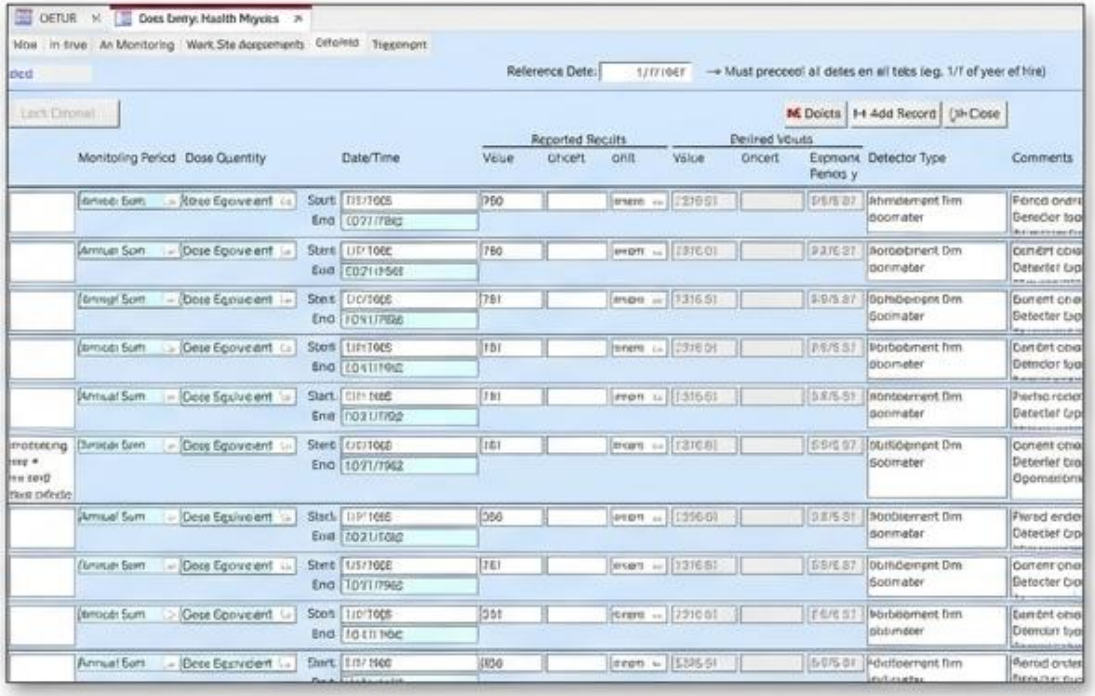
Automated visualization and summation tools detect anomalies and ensure historical data integrity.

Visualizing Bioassay Excretion Profiles



Automated plotting of bioassay data across time instantly highlights data entry errors or genuine biological anomalies for researcher review.

Verifying External Dose Summation



The system automatically executes a verification loop: calculating annual external doses by summing entered monthly/quarterly values to explicitly cross-check against reported worksite annual totals.

Closing historical gaps: A multi-year initiative to identify, request, and digitize 41 missing Hanford cases.

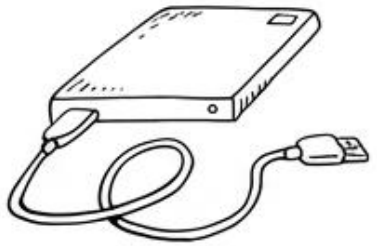
Phase 1: '2024 - Oct

Formal document request initiated for targeted missing records.

Phase 2: '2025 - May

Test package of 2 cases received to optimize the formatting and digital transfer pipeline.

Phase 3: '2025 - Nov



Final package for all 41 cases received via digital transfer.

STATUS: Data Entry Currently In Progress.

The USTUR Health Physics database is fully operational and actively powering next-generation actinide research.

Standardized.
Searchable.
Quality-Controlled.
Ready for Analysis.

Thank you for your attention!

Questions?