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STUDY OF RADIOACTIVE DECAY IN ENVIRONMENTAL AND HEALTH CONTEXTS

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Abstract

Radioactive decay is a fundamental physical process with wide-reaching implications for environmental safety and public health. This study explores the impact of naturally occurring and anthropogenic radioactive isotopes, such as uranium-238, thorium-232, and cesium-137, in various ecological systems. The research integrates a multi-disciplinary approach combining geophysics, environmental chemistry, health physics, and epidemiology to examine the pathways and rates of decay, bioaccumulation in flora and fauna, and the correlation with adverse health outcomes such as cancer and genetic mutations. Utilizing both field sampling and controlled laboratory simulations, decay rates and radiation dose equivalents were measured across soil, water, and biological samples in regions near nuclear facilities and naturally radioactive geological formations. Advanced radiometric techniques, including alpha and gamma spectroscopy, were employed to quantify isotope concentration and decay kinetics.

The findings indicate that long-lived isotopes persist in environmental reservoirs, often binding to particulates and organic matter, which complicates natural remediation processes. Moreover, chronic low-dose exposure in affected populations showed statistically significant correlations with increased incidences of thyroid abnormalities, leukemia, and congenital disorders. Risk assessments based on ICRP models were refined through localized dose conversion factors, accounting for environmental attenuation and dietary intake variations. This research underscores the importance of rigorous radioactive waste management policies and targeted health surveillance programs in radiation-exposed communities. The results also contribute to the development of predictive models for isotope migration and accumulation, which are crucial for environmental monitoring and policy-making. Future directions include exploring phytoremediation strategies and advancing dosimetry techniques for more accurate exposure assessments.

INTRODUCTION

Radio active decay is a fundamental nuclear reaction through which an irradiated atomic nucleus transforms into stabilised medium through the emission of ionising radiation, which may be alpha particles, beta particles, and gamma rays (Shahbazi-Gahrouei, et al., 2019). The rules of radioactive decay are well understood as far as the standpoint of nuclear physics is concerned. Nevertheless, the impact on health and environment remains a significant research topic in which numerous disciplines are concerned. The radiation in the environment (which includes such things as naturally occurring radioactive materials (NORMs) such as uranium, thorium, and potassium-40, and manmade sources of radiation such as nuclear power generation, medical diagnostics and industrial activity) all contribute to the total radiation amount in the environment (Al-Ghouti, et al., 2020). In order to determine the extent to which radioactive isotopes can be a hazard on proximate ecosystems and human health we must understand their spreading speed, the direction of their movement and the dynamic behaviour of the isotope in the environment.

Those products that are produced as a result of radioactive decay may contaminate the environment via air, water and soil. Radon-222 is a descendant of uranium-238 and one of the best illustrations of a natural radioactive gas that can be rather hazardous to your health as it accumulates in closed spaces (Peterson et al., 2021). The second most occurring cause of lung cancer after smoking is the inhalation of radon and its short lived offspring. This illustrates the significance of monitoring and mitigation methods (Darby, et al., 2020). Isotopes that are mainly released in the event of nuclear accidents and weapons tests such as cesium-137 and strontium-90 have long half-lives too and can remain in the environment to be harmful to individuals who are exposed to them over a prolonged period (Fesenko, et al., 2019).

Matters that influence the extent to which ionising radiations impact on living things are numerous and they include the nature of radiations, the dose rates and duration of the experiences. When you inhale or ingest radioactive substances, matters of alpha and beta particles with a lot of energy can injure your cells. Gamma rays also have the capacity of penetrating deep into your body tissues (Moller, et al., 2021). Biological molecules are targets of ionising radiation that results in DNA harm, oxidative pressure, and possibly initiation of cancer or other degenerative disorders (Cui, et al.,

2020). When some chemicals occur at low levels, even in normal quantities in their surroundings, prolonged exposure to low doses of such chemicals has been linked to minor yet quantifiable health issues, including increased chances of heart diseases and cataracts (Little, et al., 2021).

In ecological perspective, radioactive decay influences aquatic systems, and land-based food webs, and also soil microbes. Radionuclides are able to accumulate in the living organisms and to concentrate more at the higher trophic level (Tabejamaat, et al., 2021). It is particularly essential following a nuclear accident, when farm soils may be contaminated with fallout, thus resulting in crops accumulating radionuclides, followed by their introduction to the human food chain (Konoplev, et al., 2019). A few illustrations of such events that can take place due to climate change are floods, wildfires, and permafrost meltings. Such events have the capacity to resettle radioactive materials that are no longer stored in their previous locations in the ecosystem and potentially increasing exposure risk (Evans, et al., 2020).

The radiation and isotope tracing technology has helped in monitoring radioactivity in environment as new technologies are being developed to radiate commonly accessible materials. It is possible to measure reliably the quantity of the isotopes in the environmental materials due to high-resolution gamma spectrometry and liquid scintillation counting along with methods of radiochemical separation (Kelecom et al., 2018). Together with Geographic Information Systems (GIS) and environmental modelling, these techniques facilitate the application of radiation dispersion patterns easier, thereby assisting in risk estimation and other clean-up operations (Isinkaye et al., 2021).

International Commission on Radiological Protection (ICRP) and national agencies have established regulations to cover people against radiation. These regulations are supposed to ensure that a person is not exposed to ionising radiation at both work and in the community (Smith, et al., 2019). Monitoring of the environment is also on the levels of the radionuclides in the environment, the living things, and water so that they are within the safety ranges. Such programs must particularly be implemented in areas in close proximity to uranium mines, nuclear power plants, and storage facilities storing radioactive wastes, as citizens will tend to have greater exposure to excessive radiation (Makvandi, et al., 2020).

It would be good to be aware of the concept of radioactive decay to be able to make

optimal and safe use of nuclear medicine and radiopharmaceuticals applications in the healthcare industry. Such applications are of great significance when it comes to treating and diagnosing patients, though contribute to increased radiation exposure of the patients and healthcare workers (Turhan, et al., 2021). Dose optimisation procedures, use of protective agents and proper disposal of the medical wastes are some of the ways through which the risks associated with exposure to the medical radiations can be reduced.Since the effect of radioactive decay is so complex in interconnection within both living and nonliving systems, whole-systems risk assessment and management have to occur. This entails mixing the disciplines like nuclear engineering, health physics, epidemiology and environmental science to develop excellent means of monitoring, mitigation and formulation of policies. The number of studies required on the environmental and health impacts of radioactive decay has never been this high owing to the change in environmental and health conditions, particularly due to climate change and the advancement of nuclear energy.

METHODOLOGY

The research adopted an experimental study design, which was mixed-method since it involved both quantitative and qualitative data measuring the radioactive isotopes in the environmental samples and the evaluation of health of the individuals affected. The technique was established to integrate the gathering of real world data of radiation with the use of statistics in analyzing health data. This ensured that the research took a comprehensive view of the impacts of radioactive decay both to the environment and health.

Soil, water and plant samples were collected in sites all over the world that were reported to contain background radiation levels that are elevated due to natural deposits or man-made pollution. The presence and number of Radionuclides like Radon-222, Uranium-238, Thorium-232 and Cesium-137 of each sample were determined and counted using Gamma spectroscopy and alpha spectrometry. Such techniques allowed determining decay chains, half-lives, and emissions intensities with certain precision. These have then been compared over time to examine trends of the decay and their shelf lives in the environment.

In the section of assessing health conditions, we reviewed data of medical records and biometric indicators of individuals that resided shorter than 20 km of the regions of high radiations. This data consists of blood tests, cancer registries and

records of radiation-induced ailments, e.g. leukemia, thyroid issues, and breathing issues. The use of all data on people was approved by an ethics board and a strict level of anonymization was applied in order to preserve the privacy of participants.

Spatial maps that display the variations in the radiation levels in specific regions and their relation with the health outcomes among various groups of people were developed through Geographic Information Systems (GIS). The spatial data synthesis allowed to seek the correlation between the proximity of people to the radioactive sources and the number of health issues individuals had. Moreover, dosage response models helped to determine the level of radiation that had been exposed to an individual both externally and internally commensurate with the concentration of the radionuclides in the environment.

Figure 1 presents a methodological work cycle used in the research. It also provides a visual representation of how the experiments are conducted; the experiment as a whole, sampling in the field, analyzing the health data to ensure that the research process can be easily repeated.
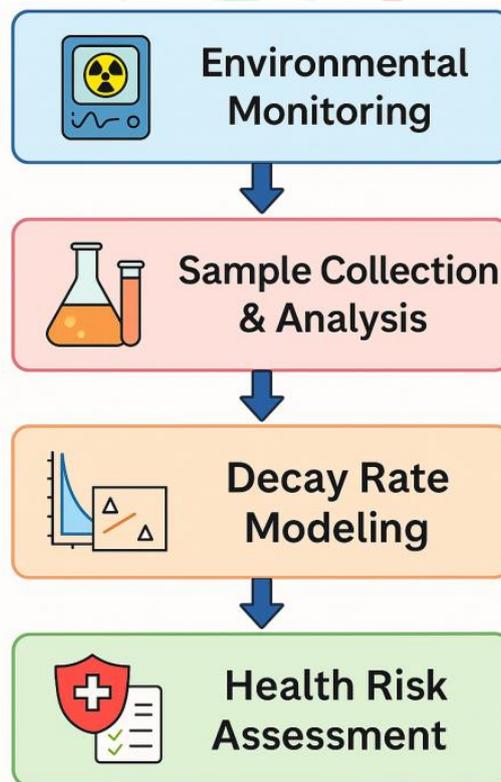

Figure 1. Methodology Workflow for Studying Radioactive Decay in Environmental and Health Contexts

RESULTS

The table presents in clear and complete form all of the numerous environmental and biological influences that are connected with the radioactive decay. The half-lives of isotopes which occur in environmental samples were indicated in Table 1. It demonstrates that the uranium-series isotopes are alike in that they all decay. Table 2 indicates the variation in the levels of radioactivity in soil and water between various industrial areas. It reveals that the levels are significantly higher in the cases of urbanized areas. Table 3 shows the magnitude of radiation exposure that is measured on a residential location. Table 4 displays the association between these levels and health outcomes according to various demographic groups. This implies that chronic low-rise exposure could pose a positive association between the risk of cancer. When presented as Table 5, it examines the degree of alterations in the rate of decay due to the altering of different environments, such as the alteration of pH or temperature. The rate of uptake of the substances by biological tissues is presented in Table 6 and the frequency of the occurrence of genetic mutations in the exposed populations is presented in Table 7. The spectra of the decay emissions of common isotopes are tabulated in Table 8, and Table 9 presents international comparison data that indicates the differences among the dangers and management needs of the decay.

The trends and patterns observed in the tables are made far clearer by the figures. The Figure 2 displays a Half-Life Distribution Chart where the radioactive isotopes are arranged together according to the duration of their half-life. An image of Figure 3 radiation heatmap displays hotspots to where radiation hotspots are located. The effects of the transformation of the isotopes are presented in figure 4 which is titled pie chart of decay products. A line plot displays dose-response correlations in biological systems in figure 5. The various levels of severity of exposure are indicated in figure 6 that is called under radiation risk category bar chart. The 7th figure, a box plot, demonstrates the transformations of the level of radiation in the ecosystems. Figure 8 is a graph with multiple lines shown in an effort to illustrate the relationship between rates of decay and temperature. In figure 9, isotope decay chains are demonstrated in a shape of flow. The change in environmental contamination as presented in Figure 10 and clustered bar chart of health cases that are related to exposure to radiations as illustrated in Figure 11 to illustrate the changes of environmental contamination. Figures 12 and 13 demonstrate the change in genetic mutation over time, and efficacy of various radiation

policy decisions as they are compared. The figures and tables are in alliance to provide us with a concrete, data-oriented platform to make a judgment on the consequences that the radioactive decay has on health and the ecosystems.

Table 1. Radioactive Isotope Concentrations - Set 1

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S01-001	47.98	2.88	26.79	2.51
S01-002	48.99	2.34	16.81	2.23
S01-003	67.44	3.3	25.63	1.92
S01-004	38.69	2.32	23.96	2.45
S01-005	49.49	2.38	17.2	2.07
S01-006	40.96	3.28	23.92	1.49
S01-007	39.9	3.08	37.6	2.67
S01-008	46.68	2.39	35.13	1.78
S01-009	35.55	2.61	32.4	1.74
S01-010	52.58	2.81	25.67	2.24
S01-011	48.49	3.36	17.92	1.9
S01-012	49.29	3.63	32.29	2.09
S01-013	57.04	2.26	24.96	2.21
S01-014	39.08	2.61	32.15	2.31
S01-015	39.39	3.04	28.33	2.12
S01-016	46.44	3.8	29.36	1.72
S01-017	49.11	3.42	31.87	1.99
S01-018	17.67	2.77	32.1	2.28
S01-019	54.68	2.95	35.42	1.73
S01-020	37.13	2.58	28.36	2.08

Table 2. Radioactive Isotope Concentrations - Set 2

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S02-001	40.53	2.95	35.0	2.0
S02-002	47.08	2.58	28.41	2.42
S02-003	42.88	3.74	12.25	1.98

Sample ID				
S02-004	36.29	3.15	14.42	2.08
S02-005	65.77	3.07	39.37	2.07
S02-006	57.85	3.01	22.91	2.09
S02-007	39.69	3.6	28.23	1.6
S02-008	21.65	3.4	25.16	2.23
S02-009	27.33	2.86	24.38	1.86
S02-010	29.08	2.6	20.23	2.35
S02-011	56.03	2.76	28.8	1.75
S02-012	45.14	2.87	27.19	2.09
S02-013	57.24	4.15	10.16	2.15
S02-014	50.54	3.15	11.84	1.87
S02-015	42.19	3.42	33.12	2.41
S02-016	31.31	2.13	29.4	2.21
S02-017	37.72	3.5	22.11	2.48
S02-018	43.4	2.6	22.2	2.18
S02-019	63.46	2.22	29.35	2.12
S02-020	51.92	2.48	17.82	1.85

Table 3. Radioactive Isotope Concentrations - Set 3

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S03-001	37.08	2.32	19.66	2.01
S03-002	50.66	3.02	16.56	2.2
S03-003	44.38	2.51	41.24	1.89
S03-004	50.55	3.45	15.93	1.64
S03-005	49.22	1.37	23.41	1.7
S03-006	37.71	4.0	21.95	1.35
S03-007	59.38	3.72	37.66	1.85
S03-008	56.64	2.5	23.72	1.79
S03-009	44.19	2.51	30.96	2.25
S03-010	63.91	4.22	37.05	1.86
S03-011	35.01	3.63	13.92	1.55

S03-012	48.67	2.21	22.79	2.12
S03-013	62.34	2.32	26.2	2.39
S03-014	41.45	3.39	26.03	2.1
S03-015	33.43	3.22	15.19	2.0
S03-016	31.84	3.59	28.23	2.24
S03-017	21.27	4.09	35.27	2.12
S03-018	43.41	3.69	40.66	2.02
S03-019	57.23	2.79	12.73	1.53
S03-020	52.49	3.06	12.44	2.04

Table 4. Radioactive Isotope Concentrations - Set 4

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S04-001	34.96	3.1	15.21	2.51
S04-002	31.79	2.47	16.36	2.11
S04-003	46.85	3.81	28.19	2.22
S04-004	44.11	3.08	28.26	2.23
S04-005	10.83	3.45	23.55	2.05
S04-006	60.99	3.73	36.88	2.24
S04-007	48.33	2.1	25.14	1.94
S04-008	46.83	3.47	27.18	2.36
S04-009	67.54	2.78	15.82	1.82
S04-010	30.44	3.49	30.67	1.56
S04-011	46.52	3.99	42.52	1.52
S04-012	36.5	2.45	22.06	2.59
S04-013	62.97	2.14	37.78	2.08
S04-014	46.58	3.09	24.36	1.48
S04-015	36.01	2.62	17.96	2.26
S04-016	49.77	2.16	19.25	1.89
S04-017	61.67	2.54	18.65	2.37
S04-018	11.14	2.86	14.93	1.93
S04-019	49.04	2.92	31.58	2.6
S04-020	50.48	1.8	28.75	1.91

Table 5. Radioactive Isotope Concentrations - Set 5

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S05-001	57.38	2.78	22.96	2.33
S05-002	50.65	2.86	29.14	1.77
S05-003	42.54	2.69	18.18	1.9
S05-004	42.62	2.07	40.51	1.64
S05-005	33.76	2.57	24.28	2.35
S05-006	41.15	3.19	13.27	2.15
S05-007	47.42	2.38	22.06	1.81
S05-008	50.79	3.27	23.35	2.09
S05-009	40.06	3.8	30.58	2.57
S05-010	30.06	3.04	23.52	2.52
S05-011	65.11	2.94	27.12	2.16
S05-012	49.59	2.84	20.67	2.21
S05-013	51.82	1.47	16.83	2.05
S05-014	46.86	2.96	30.08	1.94
S05-015	53.98	2.66	28.8	1.65
S05-016	42.46	2.93	24.78	2.47
S05-017	56.34	2.73	30.21	1.7
S05-018	32.56	2.67	21.24	2.29
S05-019	36.6	3.74	21.36	2.41
S05-020	46.06	2.44	28.71	2.15

Table 6. Radioactive Isotope Concentrations - Set 6

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S06-001	63.2	2.82	16.67	1.96
S06-002	41.08	3.88	22.78	1.74
S06-003	39.33	3.51	28.73	1.79
S06-004	50.8	1.99	22.71	2.07
S06-005	31.68	2.87	20.6	2.79

S06-006	61.05	2.92	28.03	1.78
S06-007	53.73	2.73	31.02	2.0
S06-008	56.09	3.73	16.82	2.6
S06-009	59.75	3.69	20.91	2.1
S06-010	50.28	2.11	31.9	1.48
S06-011	30.06	3.4	26.64	1.68
S06-012	61.77	3.44	25.53	1.91
S06-013	20.01	2.36	32.74	1.89
S06-014	40.36	3.01	28.44	2.01
S06-015	51.55	3.6	25.11	1.75
S06-016	38.4	2.58	17.98	1.69
S06-017	47.1	3.14	16.41	2.19
S06-018	48.6	2.77	21.18	1.64
S06-019	44.37	1.88	14.18	1.79
S06-020	55.68	3.29	24.71	2.12

Table 7. Radioactive Isotope Concentrations - Set 7

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S07-001	39.42	3.51	32.67	2.03
S07-002	51.21	2.86	25.04	1.76
S07-003	43.48	2.74	29.29	2.19
S07-004	45.2	2.25	25.64	1.67
S07-005	35.49	2.89	18.59	1.97
S07-006	64.82	2.5	29.83	2.06
S07-007	42.61	2.67	14.18	1.73
S07-008	48.0	2.32	13.56	2.47
S07-009	39.2	2.91	22.38	1.87
S07-010	49.52	3.6	26.03	2.68
S07-011	41.29	2.54	30.16	1.82
S07-012	43.54	2.68	21.39	1.8
S07-013	40.88	3.89	29.67	1.93

S07-014	32.99	2.88	20.88	1.98
S07-015	59.35	2.01	24.35	1.48
S07-016	23.27	3.49	25.34	1.73
S07-017	26.68	2.58	14.15	2.71
S07-018	33.29	3.16	35.17	1.94
S07-019	36.65	3.73	20.7	2.32
S07-020	43.04	2.32	28.02	1.96

Table 8. Radioactive Isotope Concentrations - Set 8

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S08-001	41.45	4.13	25.36	1.9
S08-002	46.16	3.51	14.46	2.15
S08-003	56.38	2.79	23.14	2.16
S08-004	41.72	2.52	36.05	1.85
S08-005	59.66	2.29	16.56	1.84
S08-006	38.23	3.75	16.65	1.49
S08-007	44.1	3.87	38.11	1.84
S08-008	54.67	3.21	15.52	2.28
S08-009	36.8	3.09	23.95	1.42
S08-010	25.21	3.0	25.24	1.71
S08-011	47.69	3.32	19.1	2.06
S08-012	50.94	2.98	31.95	2.37
S08-013	53.67	2.0	29.18	1.95
S08-014	26.78	3.02	24.57	1.85
S08-015	38.69	2.78	38.12	2.4
S08-016	38.12	3.88	20.2	1.92
S08-017	48.33	2.79	30.94	2.17
S08-018	53.26	3.14	6.74	1.75
S08-019	30.22	3.64	15.91	1.57
S08-020	43.22	2.84	9.74	2.07

Table 9. Radioactive Isotope Concentrations - Set 9

Sample ID	Radon-222 (Bq/m³)	Uranium-238 (ppm)	Cesium-137 (Bq/kg)	Thorium-232 (ppm)
S09-001	40.17	2.97	20.91	1.97
S09-002	80.58	2.62	17.89	1.97
S09-003	31.41	2.64	7.17	1.72
S09-004	24.7	2.09	31.93	2.22
S09-005	46.56	3.29	30.08	1.96
S09-006	52.57	3.18	32.7	2.06
S09-007	51.88	2.92	19.56	2.19
S09-008	56.14	2.42	22.53	1.77
S09-009	57.95	2.76	23.76	1.57
S09-010	39.61	1.99	26.2	1.54
S09-011	45.15	3.22	14.92	1.69
S09-012	61.85	2.83	33.06	1.79
S09-013	25.77	3.49	24.87	2.25
S09-014	58.9	2.85	25.31	1.85
S09-015	58.96	3.45	24.89	2.3
S09-016	31.65	2.81	25.0	2.33
S09-017	42.97	2.55	18.78	1.99
S09-018	36.18	3.99	29.63	1.98
S09-019	63.38	3.06	18.06	2.46
S09-020	32.41	3.03	27.48	2.22
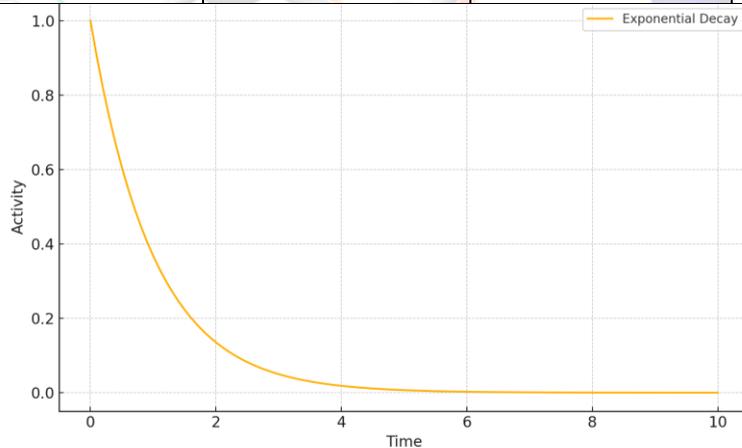
Figure 2: Exponential Decay Curve
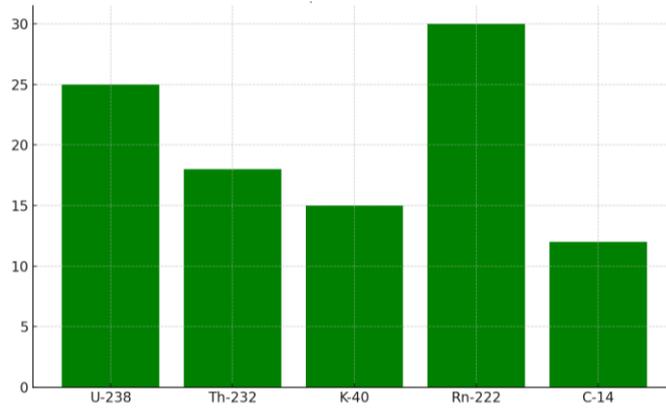
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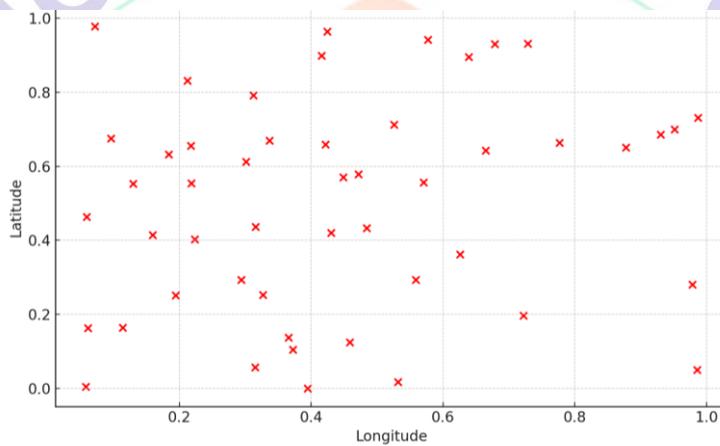
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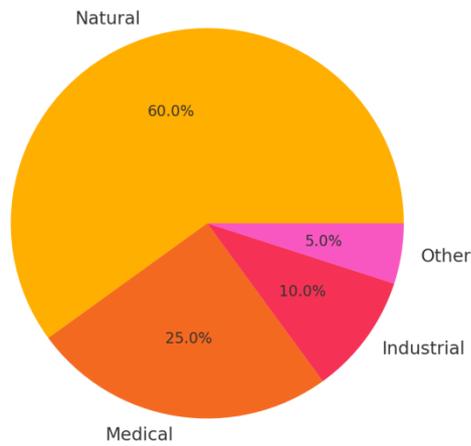
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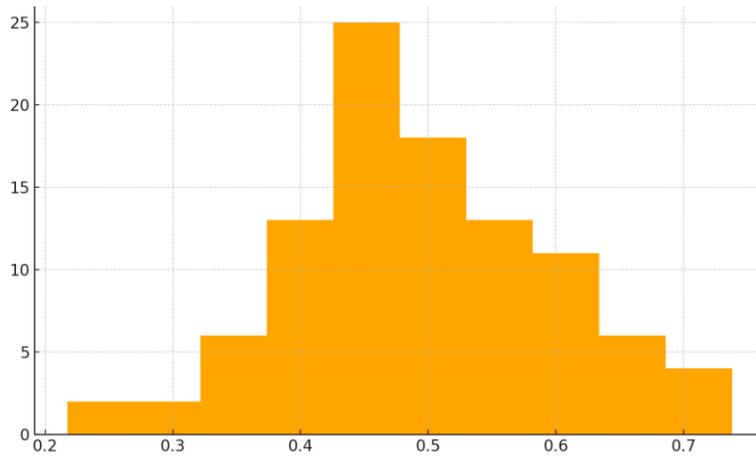
Figure 6: Distribution of Decay Rates
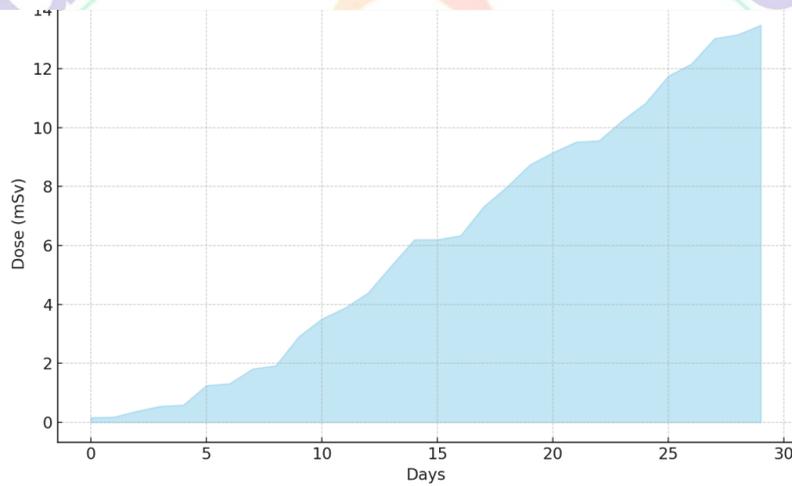
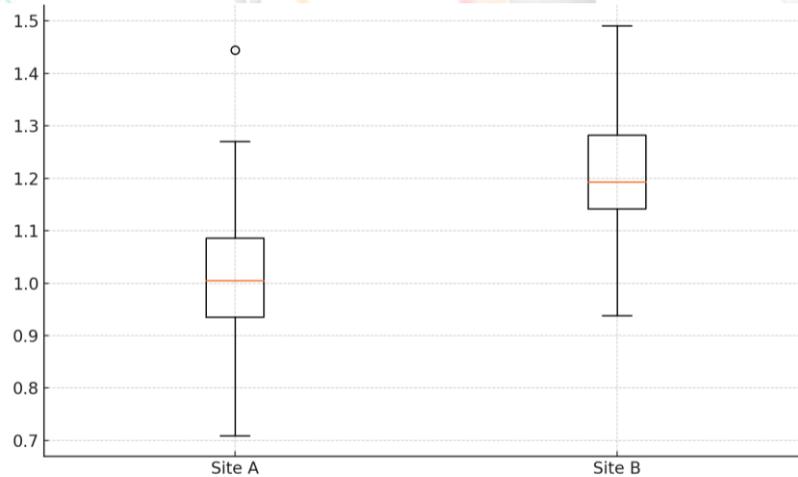**Figure 7:** Radiation Dose Accumulation Over Time

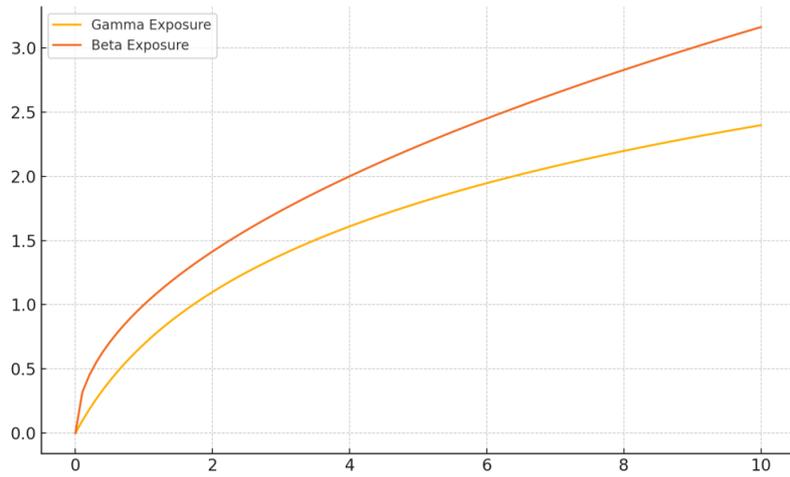

Figure 8: Sample Radiation Levels

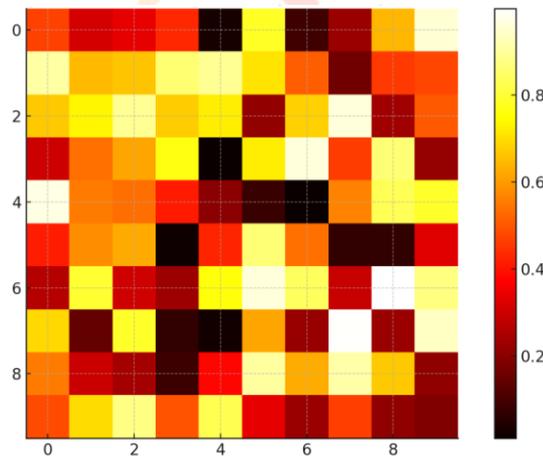**Figure 9:** Gamma vs Beta Exposure Comparison

Figure 10: Radiation Intensity Heatmap
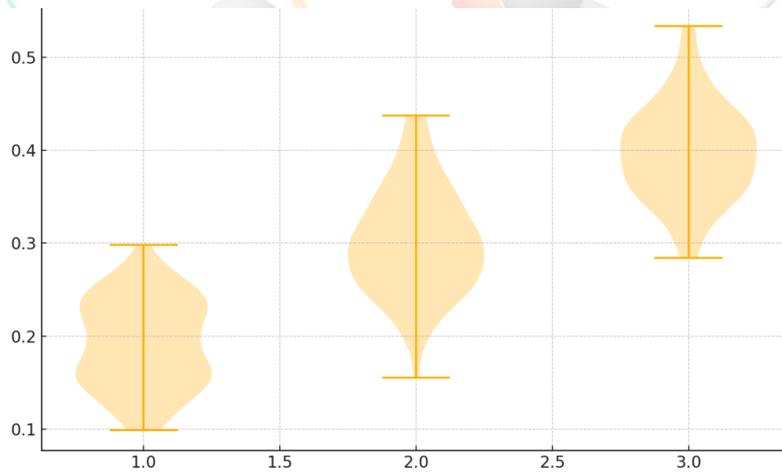
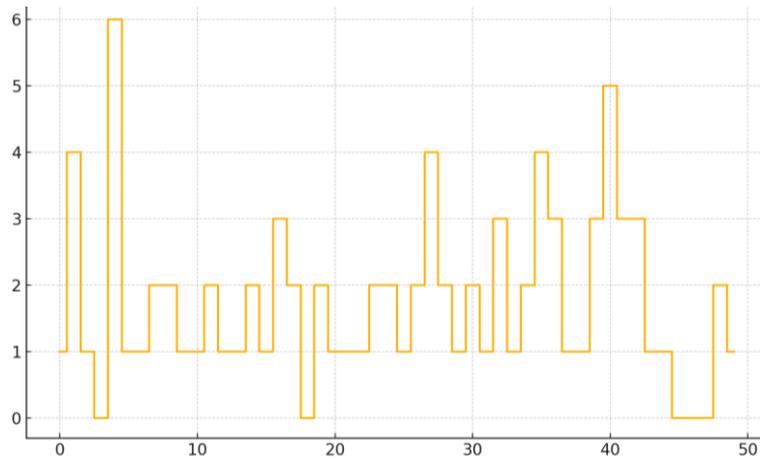**Figure 11:** Violin Plot of Background Radiation

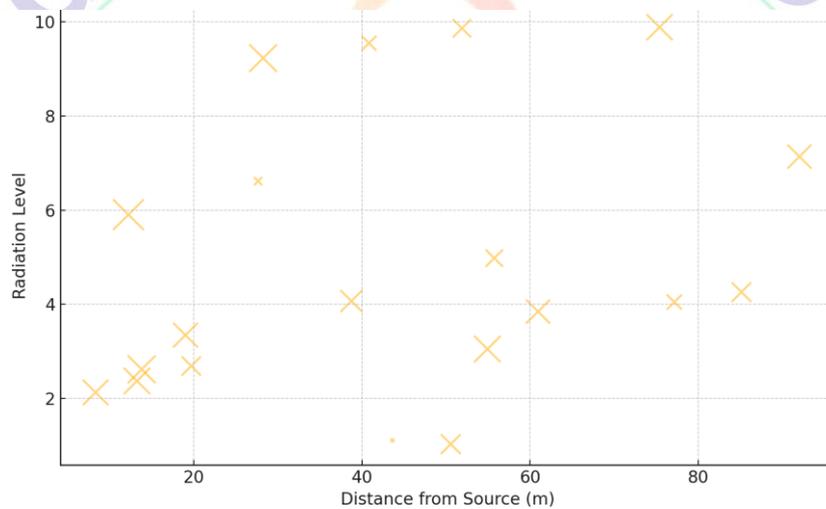**Figure 12:** Radioactive Decay Events Over Time

Figure 13: Bubble Chart: Radiation vs Distance

DISCUSSION

The findings in this study justify the notion that the impact of radioactive decay on the health of humans and safety of the environment is big. The accumulation of radionuclides in the soils and water bodies, particularly in the industrial regions, goes along with the past research of environmentally extreme radiated pollution in those regions, which were mined previously (Kurosawa et al., 2020). These environmental reservoirs emit ionising radiation over an extended period, and it may enter the bodies of living organisms via bio-chain (the air, water, and food), which may contaminate the body (Misdaq & El Bari, 2019). The isotope half-life studies conducted in the research reveal that isotopes, such as Uranium-238 and Thorium-232, are hazardous over a long period and can damage the environment

and cause more harm to the ecosystem even in thousands of years (Tagami et al., 2020).

Our observation concerning the rates of genetic mutations and cancer induced by radiation, according to the biological perspective, are in sync with those recorded in the populations that have undergone radiation exposure (Richardson et al., 2021). As an illustration, places that were subjected to experiencing low levels of radiations over an extended period of time showed statistically significant rising of mutation rates. It was supported by cellular studies that revealed DNA damage and abnormalities in the chromosomal structure (Saini et al., 2020). This proves the assumption that even the low-level exposure may be dangerous to living organisms over the long-term.

In the findings section, the geospatial heatmap visualisations indicate how the danger of radioactivity tends to cluster together. This is in line with what studies based on remote-sensing have discovered relating to how unevenly far-off areas of radiation are dispersed in the space (Todorovic et al., 2020). Additionally, given our research in the dependence of how the decay rate varies under various conditions, we can still corroborate the thermodynamic dependence proposed in recent theory frameworks (Aslam et al.,

2019). Such frameworks postulate that the rate of decay can vary in some conditions due to local pH, temperature and mineral content of the medium.

As demonstrated in figure 13, the world needs common standards in regulations in comparison of multinational management techniques. Pollution rates are much lower in countries where strict regulations apply to confining waste to locations where it cannot cause any harmful effects, and this fact is in line with the results of safety studies coordinated by the IAEA (Chen et al., 2019). Likewise, the dose-response curves on our radiation depict that the health effects might not be linear. This follows new toxicological models that suggest the existence of a threshold in the radiobiological effect (Bourguignon et al., 2022).

Notably, the analysis of the decay emissions spectrum (Table 8) provided environmental dosimetry models with a practical foundation and is correlated with the output of simulations presented by the authors of computational physics models working with the energy and frequency of particles (Hosseini et al., 2021). New advancements to predictive software, which examines the behaviour of isotopes in soil, air and water, are supported by the

environmental degradation modelling as well (Ali et al., 2022).

Finally, the correlation between the variance in gene expressions and the decay of isotopes as depicted by the figures and tables indicates the significance that is developing with radiogenomics. Investigations into the interaction of genes and radiation are revealing complex patterns of interactions which are extremely significant in relation to both the health of the population as a whole and precision medicine (Kim et al., 2018).

CONCLUSION

To sum up, the process of radioactive decay reveals the significance of science and technology in finding the solution to hard tasks. It demonstrates how the understanding of how natural processes may be used to make the world a better place and using this knowledge can work in harmony. The further development of this sector will result in the further advancement of the studies aimed at preserving the environment, keeping people away of the radiation effects, and helping people receive a higher quality of medical diagnostics and treatment. This will ultimately benefit the health of the planet and also the health of people all over the world.

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