

## Questions and Answers on the UNSCEAR Public Exposure Global Survey

Status: 2021-06-07,

New questions since the last distribution are highlighted

| Questions  | Answers  |
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| <b>General</b>   |  |
| We have a lot of the requested data in other table formats or databases (INIS). Is it enough for you if we deliver this data to you without further reformatting or does the data inevitably have to be transferred into UNSCEAR's table format? | Our preference will be if NCPs present and submit the requested data electronically using the questionnaire format as this is the matter of quality of the data. NCPs can also send the data (preferably in electronic format in reports or databases (e.g. csv format) and we will import them to the UNSCEAR database, but the secretariat will come back to NCPs for a quality check in order to make sure that the data is correct.  |
| In a case where there is no published scientific data, can the country add data based on measurements taken by the industries (internal reports) and how will UNSCEAR verify the quality, in this case?  | For the global assessment it is important that we have quality data from each Member State. In this case, it would be up for the expert subgroups to make sure how this could be relevant for the global assessment. The expert subgroups also review the peer-reviewed literature to complement the missing data. We have technical experts in subgroup 1, who ensure the quality of data used in the project. If the countries have companies working with data and they find the data trustworthy enough to share with UNSCEAR – you are welcome to use it after careful review. Officially, this would be national data shared by the Member States with UNSCEAR.  |
| Should we only report information for which there is a reference in form of a peer-reviewed publication or report?   | We are looking for any relevant peer reviewed information that you can provide. This can be an article or a governmental report that has undergone an independent review and can provide reliable information and data to the UNSCEAR questionnaire. The reference field is there for your convenience if there is a report that provides additional information on the method how the data was collected, analysed, calculated and the source. This can be a short description from your side, a web link or you can submit a report electronically. In parallel to the survey, our expert group is conducting a search for peer reviewed literature in the time frame of 2007 to 2022. Both sources of information will complement each other. |
| <b>SG2</b>   |  |
| What are the criteria/definition for high background radiation areas?  | If you have an area in your country where the background exposure deviates 3,4 or 5 times from the standard values, or it is in some way unusual – please report it. The UNSCEAR has concluded that natural radiation sources indicate that the average annual effective dose to the world population is approximately 2.4 mSv, which is the same as the previous estimates.   |

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| <p>The cosmic rays are not to be included separately in relation to this topic. Also, this type of survey usually indicates the number of miles covered, not number of measurements conducted.</p>  | <p>We request absorbed dose rate in the air or ambient dose equivalent rate at ground level, which includes cosmic radiation. But we do request dose rates caused by cosmic rays separately. If a country has conducted measurements of dose rates from cosmic rays separately, please share that data as supplementary data.</p>  |
| <p>Water treatment plants are only to include ground water.</p>   | <p>At present we primarily focus on the topics of previous reports, which is the ground water and not the surface water. If you do not have some information or you have different information related, please state this in the comments and explain why.</p>   |
| <p>Reports focus mainly on radioactive waste, but not explicitly from the NORM industries.</p>  | <p>We will cover NORM waste from oil and gas, other NORM industries, and radioactive waste, as some countries do not categorise NORM waste as radioactive waste. Please specify in your response how waste from NORM industries is classified.</p>   |
| <p>90% of the time the exposure is indoor exposure and NORM is used in building materials. What would be the place to provide this information?</p>   | <p>In section 1.1.1 of the questionnaire we are requesting both, indoor and outdoor absorbed dose rate in the air or ambient dose equivalent rate at ground level. We included building materials separately in section 1.1.3.</p>   |
| <p>For part 1 on exposure from natural radionuclides, we are wondering if some fields are missing. The ‘note’ on the top of the page states that data is requested for “Concentrations of natural radionuclides in water, food, soil, rocks, and other raw material”, amongst other things. However, from what we can see, there are no fields for information on radionuclides in water or food. We can only see that dose rates, soil and building materials (1.1.1-1.1.3), as well as information on NORM industries (1.2). Are there any fields missing, or have we misinterpreted?</p> | <p>Thank you very much for pointing this discrepancy out. Following the email of Ms Batandjieva-Metcalf of 7 May, the notes requesting data for “Ambient dose equivalent rates”; “Concentrations of natural radionuclides in water, food, soil, rocks and other raw materials”, and “Annual effective dose” were removed from the questionnaires, as the corresponding tables only request data for air dose rate and natural radionuclides content in soil and building material. The revised questionnaire is uploaded to the UNSCEAR global survey platform. The topic of radionuclide concentration in food and drinking water is however very important but will be addressed in the project through literature review first.</p> |
| <p>In case there is a lot of data from many projects/surveys how can I provide data?</p>  | <p>The requested data is the average value(s) for your country. If there is too much data, please calculate the arithmetic mean and the standard deviation. Please also provide the data you have used for the calculation, methodology, as well as the minimum and the maximum values.</p>  |
| <p>Are regulatory documents in national language acceptable as references? (which are not available on the internet, but contain for example actual laboratory measurements)</p>  | <p>The expert group would much prefer to have documents in English, however, if this is not possible, please do provide them in the national language with a brief summary in English. Also, please suggest which parts of the document would be particularly relevant for this UNSCEAR survey.</p>  |
| <p>Regarding supplementary data: Is activity concentration data for NORM waste only requested if we have a dose estimate? We have some concentration data, but not dose estimations.</p>  | <p>We would need the activity concentration data if you do not have any other data, focusing on exposure levels in particular.</p>   |

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| How to treat the values less than the Minimum Detectable Activity (MDA) in the statistics?  | In different countries the criteria are different. Please highlight the MDA and explain in the comments box that the values were below the MDA values.   |
| For NORM industries only data on waste is requested. Is data on liquid/gaseous releases from NORM industries requested in this survey?  | The expert group considered this point in the preparation of the survey. Now, we are primarily relying on scientific peer review literature for collection of this data, so it is not essential to provide this data at this stage. If there is no data available in the literature on this in a particular country, we shall come back to the NCPs of those countries and request the data. |
| Due to Fukushima NPP accident, there have been higher exposure dose rate level areas. Should we exclude them from the survey of SG2 or include as HBRA with comments?   | Yes, please exclude artificial radionuclides from the questionnaire of SG2, as they are only including natural radiation background areas. Exposure from artificial radionuclides from accidents should be included in the responses to questionnaire of SG7.  |
| Could you please clarify once more how to deal with soil activity concentrations? Do you prefer an average from all different soil types in the country? Or an average per soil type?   | We would only need one set of values representative for all soil types in your country together. Thus, please provide an average number for the entire country. If you have any additional information, please provide it as references and in the comments section.   |
| Does your subgroup examine public exposure associated with airline travel?  | Yes. In most of the countries there are methods of measuring relevant exposure. If you have routine measurements with new data since the last report, please do provide it.  |
| In 2018 we had a programme modelling impact assessment and we collected data from scientific publications, which was submitted to the IAEA. The data was focused primarily on natural radiation. Would you like us to submit the same data?   | If possible, we would appreciate receiving the references for such data. We are also in contact with the IAEA and can liaise with it to retrieve the data, if needed.  |
| <b>SG3</b>  |  |
| We have a project which estimates exposure in new buildings, but the project runs towards 2022. Should we include the results?  | Yes, however, please submit the data you have so far, as well and indicate in the response (due in Sept 2021) that there will be other data submitted in the future.   |
| We have surveys which already were used in previous UNSCEAR reports. Should we include these?   | Yes, if relevant and indicate this in the comments section of the questionnaire.   |
| If a publication has only the necessary measurements for maximum/minimum data or some requested information such as geometric mean, median or geometric standard deviation are not in the articles or reports, does UNSCEAR calculate them, or are we expected to so? Or shall we only provide the data without evaluation? | Please calculate it as this data is necessary, where possible. If the data can be provided in the electronic format, we can also do those calculations. If it is not possible to share the requested data, please cite the information and submit the reference (e.g. report) to us, then the expert group will see if we can evaluate it.   |

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| Some requested information such as Geometric mean, Median or Geometric standard deviation are not in the articles or reports, should they be calculated or just cite the information in the article or report? | Please calculate and present the requested data, where possible.  |
| What is meant by seasonal correction?  | Radon concentrations in air can vary seasonally, an average over several months may not accurately represent mean annual radon concentrations. Some countries therefore provide seasonal corrections, but some do not. For us, it is important to know if seasonal correction was applied or not to interpret the data. Any comments and additional information can be provided in the “Comments” section.  |
| Are you going to propose some calculational method for radon? Is it going to be the same as UNSCEAR 2000 or 2008 reports or is there a new approach?   | The methodology the expert group will use will be very similar to previous UNSCEAR reports. We think about improving the methodology a little, in order to extract more data. For example, data on different climatic situations. When we treat the received data, we will see if the methodology can be improved to extract more information for the purpose of the UNSCEAR report.  |
| If the information was evaluated as part of academic research, should it be submitted?   | The expert group is happy to receive relevant and high-quality data for evaluation. It is important that the data is from peer-reviewed literature or reviewed and submitted by the Member State (through the NCP).   |
| Is there any information collected in relation to representativeness of the survey? Is it identified if data was only collected at ground floor in dwellings etc.?   | The expert group extracts this data from peer reviewed reports and publications and therefore do not collect this data for the questionnaire at this stage. For this reason, we are happy to receive publications and reports from you as well. This has to be peer-reviewed literature or national reports. There is also a comment section in the questionnaire where NCPs can provide further information on the representativeness of the reported surveys.   |
| Should we upload data also related to uncertainties, is there a specific section for experimental data?  | If you have assessment of uncertainties in a specific report, please share it in the “Comments” section.  |
| Is it recommended to use dose conversion factors from the 2016 report?   | In the UNSCEAR 2019 report it was mentioned that the UNSCEAR DCF did not change. Given that the uncertainties from both dosimetric and epidemiological studies give rise to a broad range of risk estimates and the fact that values from the current dosimetry and epidemiological reviews are consistent with those used in previous UNSCEAR reports, the Committee recommends the continued use of the dose conversion factor of 9 nSv per (h Bq m <sup>-3</sup> ) EEC of 222Rn, which corresponds to 1.6 mSv (mJ h m <sup>-3</sup> ) <sup>-1</sup> for estimating radon exposure levels to a population. Nevertheless, if you have data with different coefficients, please indicate this when you submit the data. |
| Information on radon of high background radioactivity areas (HBRA) should be provided in this file?  | Yes, but please indicate whether this is a radon prone area in the “Comments” section.  |

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| <p>Some additional but useful information may be presented in articles or reports, such as the effective dose or equilibrium factor, should this information be added, for example in the comments section?</p>  | <p>Please do add this information and provide the references in your responses. If there is a report on the estimated effective dose, it is important for us to see the methodology used and how effective dose was calculated.</p>   |
| <p>It is best to specify the format of the population numbers in thousands or millions?</p>  | <p>This is entirely up to you.</p>  |
| <p>Why was no information about Radon daughters requested in the questionnaire?</p>  | <p>This topic is covered in the literature review. As the expert group wanted to keep the questionnaire as simple as possible, we did not include this data in the questionnaire at this stage.</p>   |
| <p>Considering the many questions in this and other questionnaires, is it possible that the deadline could be postponed by 1-2 months?</p>   | <p>Please try to submit all of the information before the deadline. However, should you need more time for particular subjects, please inform the UNSCEAR secretariat.</p>  |
| <b>SG4-5</b>   |   |
| <p>The instructions provide definitions for reactor types, but states that this list applies to “all nuclear reactors (except research reactors)”. Norway only has two research reactors – no other types of nuclear reactors. We have no uranium mining or milling activities either. It is therefore our understanding that we should not fill out this form. Is this correct?</p>   | <p>This is correct. Research reactors are included in the scope of subgroup 6 “Applications other than nuclear power” and discharge data should be provided through the questionnaire for that subgroup. Therefore, the survey for subgroup 4 and 5 should not be used to collect radioactive discharges from research reactors.</p>  |
| <p>Are electronic forms of submission other than the UNSCEAR questionnaire also acceptable given that the amount of effort for countries with large nuclear programmes needed to complete the survey may be extensive and on the level of detail on discharge data expected?</p> <p>Is it acceptable to provide data not on an annual basis but in 2-3 years intervals because, given that the discharges tend to be quite stable within such periods and the amount of work required to fill in the survey seems to be really huge?</p> | <p>In summary, annual data are needed by the UNSCEAR expert group to provide the level of information traditionally included in UNSCEAR reports to describe the nuclear power cycle. In the past (e.g. UNSCEAR 2000 report, Annex C - <a href="https://www.unscear.org/docs/publications/2000/UNSCEAR_2000_Annex-C-CORR.pdf">https://www.unscear.org/docs/publications/2000/UNSCEAR_2000_Annex-C-CORR.pdf</a>), annual site-specific information was presented for each country, by facility type. To update these tables (e.g. Table 31 on in the 2000 UNSCEAR Report, Annex C), it will therefore be necessary to collect annual data in the form requested in the global survey, i.e. facility-specific annual discharge for defined radionuclides, as far as possible (or groups of radionuclides, where that is the form data are available). However, the expert group and the secretariat recognize that manually completing the survey tables can be a huge task for those countries with large nuclear programmes, and hope that, by offering some flexibility in the form of data provision, we can help to reduce this NCP effort. We would like to encourage you to use the template of the UNSCEAR questionnaire and provide annual facility-specific discharge data, and where not possible, in the form in which you have it available, in an electronic form (database or excel or csv file).</p> |

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| If there are different facilities on site, how do we report this?   | We expect these to be reported by type of facility. If there are different facilities of the same type on the same site and there is no separate data per each facility, we are happy to receive the data per site. However, only if the facilities are of the same type as that is how they will be reported in the UNSCEAR report.  |
| If there is only one site with facilities under decommissioning.  | The aim is to capture discharges (gaseous and liquid) from all facilities and the different parts of the life cycle at a site. If the facility(ies) was decommissioned or is under decommissioning but there is data on discharges when the facility was operational – please provide this data. Please also indicate if there has been a change in the way the facility operates in the “Comment” section.                                     |
| What if we do not have data on specific radionuclides, how do we report this, if the data is below measurable levels?       | If the data is below the level of detection, we will not be using the data for this UNSCEAR assessment. Please do not make any extra measurements or calculations in relation to this. Please provide all the information you have and use zero only if the numerical value is definitely zero. If this is not the case, please leave the cell blank and make a comment in the comment section saying that the data was below measurable level. |
| How do we approach data on radionuclides and noble gases?   | If it is by gas or by radionuclide – provide all the information you have as requested in the survey. If you only have information by gas – please provide it.  |
| In relation to data checking, will you be returning to the NCPs, should you have any questions in relation to the data?     | Yes, there will be a process of fact checking and the UNSCEAR secretariat will come back to all NCPs that provided data.  |
| Do you only need discharge data? Will you be calculating dose assessment?   | Yes, the expert group will make its assessment, in line with the UNSCEAR methodology; however, if you have information on doses to the public you have calculated, please present it so the expert group can review it and provide as context.  |
| How to address the data on discharges, which is below the minimum detection level?  | Please send us information about the minimum detection level and whatever you have at your disposal that is relevant to the questionnaire. The “Comments” section of the survey can be used to provide some context / explanation on the submitted data.  |
| For things like radon in uranium mines and mills for which we do not have specific information, how do we address the data? | Please provide the information you have, and if relevant for this survey.   |

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| <p>Laboratories for the state-owned enterprise DIAMO determine natural uranium (Unat) in water discharged into watercourses. Should we keep this value and where to write it? Under Uranium U-238 and comment in the notes or will another column be inserted? Or should we divide this value by recalculation? At the GEAM branch plant, the state-owned company DIAMO, the volume activity of radon (OAR) is measured at the outlet from the underground of the mine, but the equivalent volume activity of radon is measured in the vicinity of the tailings pond. Should we keep these values in the table and comment them in the notes?</p> | <p>Yes, please provide all the information you have and use the “Comment” section to provide background information. We are working on the approach to tackle uranium mining specifically, in particular, in relation to radon in uranium mines. This information will be further discussed and reanalyzed according to the UNSCEAR methodology, in coordination with SG3 on Radon.</p> |
| <p>Does the methodology lend itself to conservatism or realism?</p>   | <p>We will review the existing UNSCEAR methodology, but we aim to be as realistic as possible.</p>  |
| <p>Does it need to send local data like hobbies, population of people around site and so on?</p>  | <p>No, the UNSCEAR methodology uses general information about population data. However, if you have a report with such data, please share it with us and indicate in the “Comment” section that this information is present.</p>  |

**SG6**

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| <p>Should we also provide information for patient’s relatives/contacts?</p>  | <p>Yes, please provide relevant data for relatives, but no personal data. If you do not have detailed information, please provide what you have or just the operational procedures in the country.</p>   |
| <p>I discovered a leakage of neutrons from linear accelerators when the beam is off. Even when we use TODs or OSLs we cannot measure the neutron dose effectively.</p> | <p>This issue is not straightforward, however, here we look primarily for published data on public exposure at the national level. If you think that the neutron dosimetry is not adequately reflected, please indicate that this specific component is not covered yet. Please provide public exposure data you have and indicate the information missing. Any technical related data on the equipment (accelerator) is more appropriate to be addressed to other organisations such as IAEA.</p> |
| <p>Please provide us further information on medical exposure in relation to the other work done by UNSCEAR, such as the occupational exposure report.</p>              | <p>This survey and project will not cover patients, volunteers, visitors, workers. Visitors may be relatives and their exposure after the patient is released would be addressed. Only the people who are exposed among the general public in any way. The data on occupational exposure will be present in the occupational report (scheduled for approval in 2021).</p>  |

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| <p>We have some data on releases from different categories of practices and facilities, and to some extent pathways of exposure, but we have little or no data on number of exposed members of the public or dose estimates. Is it still interesting for you to receive the data we have, even though we don't have any dose estimates? At the webinar May 26th, we hope you can give examples on detailing level/the best way to fill in data under both "Essential data" and "Supplementary data" in the spreadsheet. Reporting data for each year in the period 2007-2020 will lead to a very comprehensive work for us. Can we select a representative year in the period 2007-2020 and only report the data for the selected year?</p> | <p>We would appreciate all and if not possible any subset of radioactive releases data indicated in the tables of the survey. The information on different categories of practices and facilities, the associated radionuclides and pathways of exposure would be helpful even without dose estimates. If actual data on dose estimates is not available, the relevant design criteria or operational/regulatory limits (e.g. in terms of radionuclide activity in discharges, dose rate or doses) can be interpreted as upper estimates of levels of public exposure and, thus, would be helpful. Please give them in 'Comments' section. Data for any specific year, representative year, and/or range of years would also be appreciated.</p> |
| <p>We would like to work together with the neighboring countries in the future, in order to exchange experience. Would this be possible to organize?</p>  | <p>We are happy to establish links between Member States and we shall check if we have NCP nominations from the neighboring countries upon request.</p>  |
| <p>Regarding medical exposure of population, it is likely that France (and most countries?) will be unable to answer with anything but regulatory limit.</p>  | <p>Please provide all you can, but if there is no other data – we are happy to include the regulatory limit. Please note that it is the regulatory limit in the comments section.</p>  |
| <p>Could you clarify what data you expect in relation to medical exposure?</p>  | <p>Patients and occupationally exposed personnel are not to be included in this survey. Data on public exposure, as well as hospital staff, who are not supposed to be occupationally exposed is collected.</p>  |
| <p>Regarding estimation of public exposure from industrial such as gaging and radiography, do you have any procedures or examples that could help?</p>  | <p>In the ideal case, it would be useful to have individual dosimetry data; however, any data relevant would also be accepted and considered by the expert group. The data to be presented would be very different across different countries; so please, provide the data you see as relevant and representative for your country.</p>  |
| <p>Regarding consumer products, what is the difference for NORM products and consumer products in Th or U?</p>  | <p>Please provide this data to SG6, we will then distribute the data to the relevant subgroups (e.g. SG2). We are looking at all data on public exposure from consumer products, but the process of NORM production could also be relevant for SG2.</p>  |
| <p>In industry area we have data like dose constraints from NDT activities for example. Is it useful to include in the questionnaire?</p>   | <p>Yes, please.</p>  |
| <p>With regard to industrial application, we have multiple sources of data; however, there is little focused data, specifically on public exposure. Would the data be still relevant in this case?</p>  | <p>Yes. If there are no specific estimates for the number of exposed people, please provide the data you have. We would welcome additional information in relation to the uncertainties of the reported data, including the information when NCPs submit own estimation of public exposure.</p>  |

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| If there is no other data, would you be interested in the national regulatory data (e.g. regulatory limits)?  | If there is no measurement/estimated data, NCPs can provide either national or regional regulatory limits (maximum), but please do indicate that this is a regulatory limit in the "Comments" section.   |
| <b>SG7</b>  |  |
| Data which comes from pre-2007 but was not mentioned in the previous UNSCEAR reports, should we include it as well?   | If you have information about something which was not previously published, please include it, but we will have to make an internal decision whether we use it in the end.   |
| Did you say that only sources within the country are to be listed here? I'm asking because the public can be exposed to releases from sources originating from without the country as well, e.g. from Chernobyl.  | Information on public exposure in your Member State needs to be reported. It would fall into the fallout category; they should still be reported for your country.   |
| For part 5 on legacy and accidents, it is stated that only sites currently contaminated from civil or past military activities are to be included. Are we correct to interpret this as pertaining to contamination originating from within the country? We ask specifically because in Norway, significant levels of Chernobyl fallout are still present in the environment and measures to reduce levels are still used in food production. We are wondering whether data on this type of contamination is also requested? | The survey should include any contamination sites in the reporting Member State that are being managed as a result of any activities (in the scope of this project) regardless of the origin. Therefore, Chernobyl fallout that has impacted other countries where sites have to be managed for exposure to the public should be included in the survey responses. |
| With regards to legacy sites: Are you really interested in radionuclides (e.g., Cs-134) with a half-life of 2.1 years?  | If it is giving out activity concentration and is a source of public exposure, we are interested in the data and the type of radionuclides.  |
| In Cape Verde we never had nuclear accidents should we fill in the survey? Should I write "zero" or leave it blank?   | If the country has no accidents or legacy sites and no data on global fallout, it is possible not to provide any data. In this part of the questionnaire, we are mainly interested in exposure pathways, but if there has not been any public exposure from legacy sites or global fallout or accidents, then it is possible to leave this part blank.             |
| If low levels of activity concentrations are present, should we fill in the survey? How contaminated does the site have to be?  | If the assessment data is available and it is a source of public exposure, please do submit the data.  |
| Am I right, that contaminations pre 2007 should be included in the survey, if the public is still exposed?  | If there are legacy sites but your data is prior to 2007 and this is the latest information you have – please do provide it, rather than leaving it out altogether. We would be particularly interested, if this information was not provided to UNSCEAR before.   |
| If we only have activity concentrations, but do not have dose estimates for an area, are you still interested in the data?  | Yes, if the site has served as a source of public exposure.  |

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| <p>Strictly speaking, Mayak situation is not an accident but a discharge from the nuclear facility. Will it be considered in another SG as well?</p>  | <p>As there are also connected accidents in this area (as well as planned discharges) and the discharge itself happened before modern regulations were introduced, we are still interested in this particular situation as part of this SG. Of course, there will be a link with SG4/5.</p>  |
| <p>If research was done on past mining activities of a site, can they be reported?</p>  | <p>If it is a legacy site, please provide the data in this questionnaire (SG7).</p>  |
| <p>If there are sites that were initially contaminated by past activities and those sites were again contaminated by current activities (at the time of the survey), will the data from these sites be suitable for this survey? (Survey of sites and areas contaminated with radionuclide due to past activities or accidents), please note that the data cannot be separated.</p> | <p>If the site is currently active, then the information should be supplied through the relevant group (SG4/5 for uranium mining or/and SG2 for NORM). This SG7 evaluates sites that are currently not in operation or contaminated from past practices and accidents. Please specify the activities (practice) and in case of overlap the expert group will review and decide how best to address each case.</p>  |
| <p>What are the criteria/definition for contaminated areas in this spreadsheet? In Norway, we have long-term series of whole-body measurements of the Sámi reindeer herders after fallout from the nuclear tests in the 1950s and 60s and the Chernobyl accident. We would very much like to report this data to UNSCEAR if you are interested.</p>                                 | <p>This subgroup is looking for internal dosimetry exposure measurements like Whole Body Counting. We recognize that there may be other ways that using spreadsheet provided to provide this data of the Sámi reindeer herders but please use the questionnaire format to extent possible. If you are aware of references that have been published from the measurements of the Sámi reindeer herders, then we would welcome such information. Given that the survey has been sent out to NCPs already, please report such data into the spreadsheet with relevant comments.</p> |