

**Department of Health and Human Services**  
**Agency for Toxic Substances and Disease Registry**

**Fourth Meeting of the**  
**Oak Ridge Reservation Health Effects Subcommittee**

**OAK RIDGE, TENNESSEE**  
**JUNE 11-12, 2001**

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## Summary of the Meeting

At the fourth meeting of the Oak Ridge Reservation Health Effects Subcommittee (ORRHES) on June 11-12, 2001, the minutes of the March meeting and the April 24, 2001 conference call were approved. A quorum of members were present, as were representatives of state and federal agencies and members of the public. The resignation of one member was regrettably announced. The DOE was thanked for a tour of the ORNL facility provided on the first morning of this meeting.

**Presentations** provided to the members included an **overview of the Division of Health Education and Promotion** by its Acting Director. The Subcommittee was reassured that the Division is committed to its work at Oak Ridge, regardless of leadership changes. Relevant to that, the committee requested ATSDR's attention over time to needed community communication, particularly if the study cannot prove that the health concerns believed to be ORR-associated are, in fact, so. ATSDR pledged to remain as long as it can make a reasonable contribution. The work of the Division's three Branches were outlined: the Risk Communication and Research Branch's case studies in environmental medicine; the Health Education Branch's development of strategies, models, and materials for educating the public and health care providers about environmental health matters; and the Health Promotion Branch's environmental health intervention programs, which includes the Oak Ridge needs assessment.

And **Update of the Health Education Needs Assessment** was provided. Revised survey tools will be submitted for Workgroup, Subcommittee, and IRB approval. Work remaining includes the key resource interviews, telephone survey, focus groups, and final report. The time table includes key resource interviews to be done in June and July; the focus groups in September; and completion of the health education needs assessment at the end of December. The final report will be forwarded through the Workgroup to the Subcommittee and ATSDR for comments, revisions and modifications as needed. In discussion, it was conveyed that the health education action plan will be a joint effort by the Division of Health Assessment and Consultation and the Division of Health Education and Promotion. It will be reported in December.

The **Task One Report of the Tennessee Oak Ridge Dose Reconstruction Study**, focusing on the technical issues of the dose calculation, risk estimates, probability of causation, excess cancer, and thyroid cancer analysis, was presented from four perspectives: the Project Director (Dr. Tom Widner, J.A. Jones Contracting), the ORHASP oversight and review panel (Dr. Bob Peelle), the dose reconstruction contractor (Dr. Owen Hoffman, SENES), and ATSDR (Dr. Michael Grayson). Some changes made to the I-131 report were described, some of which were a point of contention between J.A. Jones and SENES.

The **ORHASP oversight and review** pushed for a serious records search to investigate

potential off-site releases; and strove to produce unbiased risk estimates and to address the public's concerns. They explicitly considered the study's many variables through the use of a Monte Carlo analysis to determine the 95% confidence level, since there is no evidence that the median value is either the real or the best answer. They also assumed that there was no threshold below which there was no risk of excess cancer. They addressed what appeared to be the most important pathways of contamination, and set the lesser ones aside for later study.

**J.A. Jones** provided more detail, focusing on the I-131 releases from the RaLa process, which was described in detail. Its emission points included a caustic scrubber, which was not always operated properly, and the processing equipment itself, which was used well beyond its design capacity. Since the RaLa process was unpredictable and monitoring was lacking, the study estimated iodine behavior in the system through the use of expert opinion, process modeling, and drawing from other sites' experience. Most of the iodine species of interest (94-99%) were elemental in form, with fractional amounts of volatile organic, non-volatile, and particulate forms. A scrubber model estimated 99% capture efficiencies when the caustic solution was used, which dropped by a factor of ten when water was used instead. However, the consultants thought those collection efficiencies to be overestimates; they estimated a 90-99% efficiency for elemental iodine and 50-99% when water was in the scrubber. Modeling of the elemental iodine releases estimated a line loss of 20-70%. An uncontrolled release in 1954 was outlined, but its releases were estimated to be small compared to routine releases. A description was provided of the process of modeling the I-131 deposition of the 1954 accident into a gridded circle with a 38km diameter around the X-10 central stack.

Short-term iodine releases recorded in site health physics reports were compared to the modeling results. The calculation of vegetation deposition was described, and the consideration of distribution of food products, as pertained to dose. The process of calculating the excess risk was also described, including the modifying factors, background risk, and other variables considered.

At points of exposure, females born in 1952 received the highest exposure, and was higher yet for those drinking milk from a "backyard cow." The influence of local fallout from the Nevada Test Site's (NTS) atmosphere weapons testing was added to the study doses. The calculations of average time and space concentrations, volumes of milk produced in the area, and the dose and risk factors earlier described, produced an expected 6-84 excess thyroid cancers within the 38 km area; 1-33 excess cases from backyard cow milk consumption; 14-103 excess cancers within 100 km, and 25-149 within 200 km. Most of those cancers could be expected to occur after 1970; a few could occur up to 2020.

The ORHASP noted the historical lack of monitoring and the late recognition of the milk pathway of contamination, but also that Oak Ridge city residents and workers were not highly exposed because the important pathway was milk ingestion, not air inhalation. Only

those aged 5 years and drinking a lot of milk were at high risk, particularly those who drank goat's milk. There was a large range of risk. Some thyroid cancers, at most a couple of dozen, were estimated to have occurred as a result of exposure.

The ORHASP panel issued nine recommendations. Among them were to conduct a series of initiatives and public health activities in Oak Ridge; to strongly consider establishing a clinic to evaluate those who may have been affected; and to not do an epidemiological study of some of the contaminants due to low power. Ensuing discussion noted the controversy about the scrubber efficiencies, about the source of milk (even commercial milk) in the area, and the persistent unavailability of the tumor registry's data. The state epidemiologist, who was present, offered to help with the latter.

The **SENES** report has been programmed to code for individual use in estimating dose, which was demonstrated. The health implications of combined exposure to high levels of I-131, whether environmental or medical, can include destruction of the thyroid, requiring a lifetime of hormone replacement to offset hypothyroidism. Low levels of exposure can induce non-cancerous growths to the thyroid and benign nodules and thyroid function diseases such as autoimmune thyroiditis (under- and over-active thyroid). The evidence indicates that there is an elevated risk of autoimmune thyroiditis between 10-100 cGy.

Epidemiological detection is limited in its ability to find an effect between ~10-30cGy, even if it is present, because epidemiological studies have low statistical power due to the very high uncertainty of the dose estimate. But the NCI recently cited evidence that I-131, like other radiation exposures, has no dose threshold below which there is no risk. The sources of I-131 exposure were outlined (e.g., atmospheric weapons tests, medical treatments, nuclear facilities) which have produced considerable doses to individuals and populations. The gummed film network used to measure U.S. fallout during the atmospheric testing period was described.

The NCI's maps of all U.S. counties' I-131 exposures were shared. The difference between doses was shown according to average individuals and dates; children born in 1946 who drank milk with average consumption; children born in 1952 with average milk consumption; and those with the same birth date but higher-than-average milk consumption. The numbers of affected counties with dose ranges increased with each category, until the entire U.S. was shown to be affected.

The updated SENES dose and risk calculation program for combined exposures locally was demonstrated. It included I-131 released from X-10, the original estimates from the dose reconstruction, the caustic scrubbers and other ORR releases; and fallout from the NTS. The results showed minimal risk from a medical point of view, such that a person currently free of disease is likely to remain so. But the probability of causation comes into question for those with current thyroid cancer. The NTS fallout alone has been estimated to raise the chance of causing existing disease by 11-80%, and that from X-10, by 26-94%,

when including the backyard cow scenario. Oak Ridge calculations were done for both regional and local commercial suppliers. The probability of causation for regionally-supplied milk was low, but was >50% for locally-supplied milk, due to Oak Ridge releases.

Importantly, the present estimates of the probability of causation exceed the eligibility criteria recommended for compensation and care of DOE workers (i.e., the upper 99th percentile of the probability of causation exceeding 50%). That means that if the present-day rules for compensation of workers were extended to children, those who were children in the 1950s would qualify for the compensation and health care if they drank milk and currently have thyroid cancer or a thyroid nodule.

SENES' opinion was that this provided a sufficient basis for the Subcommittee and ATSDR to consider a potential public health response, such as targeted population screening of those with thyroid disease who were exposed in childhood and who drank milk. SENES also called for quantification and adjustment of the RaLa releases with regard to the caustic scrubber; matching release data with meteorological, time, and terrain data (rather than using annual data); and consideration of the cumulative effect of exposure to all fallout radioiodines including the NTS, Marshall Islands, and Soviet Union.

**ATSDR** reported the results of their experts' technical review of the dose reconstruction document and the ORHASP report on the dose reconstruction's technical matter. The *dose reconstruction technical review* found the source term analysis to be complete and reasonable, although opinion was greatly divided over the sensitivity analysis. There was unanimity that the conclusions about public health effects were accurate: doses and the risks were too small to have significantly affected Oak Ridge residents, although certain groups had higher risks (females born in 1952, people between infancy and the age of five years during the times of the releases, etc.). The potential adverse health effects from iodine exposures were felt to be adequately described.

Their review of the *ORHASP dose reconstruction report review* found the technical information to be well conveyed for the general public and the recommendations to be reasonable. Improvements suggested included clarification for the general public of why an epidemiological study may not detect any increased risk; the inclusion of zero in the lower bound of the risk estimates; and emphasis on the central estimate and de-emphasis of the lower and upper bounds of uncertainty. They found some of the report's screening level methodologies to be internally inconsistent, and they thought that this type of screening index should not be used to determine relative risk or to identify important exposure pathways. It should be used only to identify the contaminants posing a low health risk. They also noted the ingestion of contaminated vegetables and fish as primary pathways of concern (80-90% of dose), but allowed that this that may have resulted from the conservative screening, transfer, and bioconcentration factors used.

ORRHES discussion included confirmation that the Veterans Administration and the Labor

Department are using the probability of causation in their adjudication of cancer claims; clarification that, although the uncertainty is present, it is not infinite, and some conclusions can be supported about past exposures; clarification that females are at higher risk from exposure than males, and children are at highest risk because they drink more milk and have smaller thyroids, which produces a difference of 10-20 times in the dose to the thyroid.

ATSDR presented an **epidemiology workshop**. What epidemiology can and cannot do was defined, and the common steps in establishing a relationship between exposure and disease were outlined. The basic principles of the use of statistics were presented, defining "rate", incidence, association (e.g., shown in a 2x2 table), relative risk, and standardized mortality ratios (SMR). The factors integral to measuring exposure and outcomes in environmental epidemiology were also outlined, defining what an outcome is, "body burden", and the relative value of varying measurements of exposure. Also described was how ATSDR explores biologically plausible outcomes: contaminant route of exposure, toxicity or level, and potential alternative explanations for an outcome. Importantly, it was noted that health effects are not uniquely caused by environmental exposures; 1 in 2 American men will develop cancer, as will 1 in 3 women. Cancer also is a complex disease to address. Americans have many voluntary risk factors such as smoking; and cancer is not one, but probably >100, different diseases that affect 40 anatomic sites.

The sources of information used to measure adverse health effects were outlined, along with their relative strengths and weaknesses. Finally, the basic criteria for considering the conduct of a health study were defined: that it is necessary, will advance knowledge about the relationship between exposure and disease; it is likely to be able to judge a cause-effect relationship; and likely to be able to judge the dose-response relationship.

Subcommittee Discussion included a request, if further epidemiology coaching is provided, that the presenters be familiar with the Hanford study; note that privacy issues can hamper studies by discouraging study participation; that the effect of the frequency and magnitude of exposure often depends on the contaminant; the benefit of large cohorts to a study's ability to find an outcome/association; that the nature of the design stage of study is to ensure that all the necessary data will be accessible; and that stratified analysis can help to address study confounders.

An update on the **Public Health Assessment process** was provided. Evaluation of all the site information gathered over the years, and identification of any contaminants of concern, were both initiated at the March ORRHES meeting. Ongoing and subsequent work includes the identification of community health concerns, determination/evaluation of a pathway of exposure, assessment of public health implications of exposure, and report on the conclusions and recommendations, including a site-specific action plan. In a related vein, the ORHASP's additional qualitative and quantitative screening of 18 other

contaminants based on the quantities onsite and on expressed public concern was outlined. That study designated arsenic at K-25 and arsenic and lead at Y-12 as high-priority candidates for further study.

Subcommittee discussion ATSDR's agreement to investigate why X-10's coal burning was not shown as an arsenic source. It was questioned how the cumulative effects of combined materials could be addressed, noting that ATSDR will factor in NTS releases, but not those of the area power plants. The response was that that is a question of total risk, not that risk specific to ORNL that is ATSDR's mandate. While ATSDR can investigate what data are available to indicate total risk, their authority does not extend to doing detailed analyses of sites other than the Oak Ridge Reservation. Some members felt that, if all sources are not considered to indicate the true risk, the ORRHES final report should include a strong recommendation to look for all the contaminants' sources. ATSDR noted that their reanalyses, using updated maximum concentration transfer factors, can help to further establish the ORNL emission levels; and they can extrapolate potential contaminant spread to assess whether some contaminants could have come from another source. While detailed modeling of TVA or other sources is not within ATSDR's purview, if a public health hazard is determined, ATSDR will recommend a responsive public health action.

An overview of **ATSDR's screening process** was provided. Its three steps determine if the chemical concentrations are above acceptable screening levels, if they are above screening levels in areas of exposure, and if the calculated exposure doses exceed health values for each chemical in each area. The screening calculation is the Environmental Media Evaluation Guide (EMEG), used for water and soil. It multiplies the standard Minimal Risk Level times the Body Weight times the Ingestion Rate. Other factors such as bioavailability, cooking loss, chemical form of the contamination, etc., are considered later when the public health implications are examined.

Discussion included advice to ATSDR to be very clear that the limits of measurement are also a big factor, and that some conclusions may be based on equipment limitations rather than research; clarification about the origin of the ingestion rate data (for the first screening analysis, historical data from the site, state, and dose reconstruction; then for the second screening of more recent exposures, offsite sampling data); that some analysis has been done of the game living on the reservation (annual DOE monitoring reports, and Superfund cleanup ecological studies will include such data); and that, although the EMEG parameters are primarily for adults, any concerns particular to children are carried through in the analysis (e.g., lead).

The **ATSDR Program of Work** was presented in chart format and is attached to the minutes. Committee discussion included how to evaluate conflicting studies and how to solicit that kind of information.

**Workgroup reports** were provided by the Agenda, Public Health Assessment, Guidelines and Procedures, and Communications and Outreach Subcommittee Workgroups, all of whom were very active. The Health Needs Assessment Workgroup reported initial discussion of some of the issues related to the assessment and the opening of communication links to help the work proceed better.

A proposed Communications and Outreach Strategy was accepted by the Subcommittee, as was a proposed list of recommendations to ATSDR. A presentation of the ORRHES Website outlined the contents approved for placement to date (the Community Health Concerns Comment Sheet, the Oak Ridge Reservation Health Effects Subcommittee; and a summary of the March meeting). Subcommittee discussion included clarification that the health concerns collected will be retained as part of the record, but the format and contents of the database have not yet been determined; that the assessment could be broadened to collect other information on additional contaminants, pathways, or reports not addressed by ATSDR to date, if they relate to the public health assessment process; and advice that ATSDR include a few paragraphs about the many uses of this information and to invite the public's anonymous or attributed comment.

**Public comment** was provided by several members of the community and is detailed in the minutes. The comments included:

A denunciation of the I-131 study done of Oak Ridge releases, of the lack of progress made on the community's behalf after ten years of "community committees", of the need for a health study to show the exposures have been, and for health care for those already sick and dying. Funding should go to those priorities rather than further epidemiological study.

Doubt expressed about the scientific methods and the truthfulness of the DOE, ATSDR, and CDC documents used, which the panel was urged to not blindly accept as acceptable science.

A request that public comment be allowed throughout the meeting, and particularly during the presentations. (The Chair explained that the ORRHES had decided against the latter to allow uninterrupted full presentations and to ensure time for discussion.)

Advice to ATSDR to not only do the surveys, but also to listen to the information of offsite residents; to allow more comment than in only two 15-minute public comment periods; and questioned if any sick workers or sick residents were members.

The committee as reminded that DOE had publicly admitted that their records are flawed and inaccurate, and that is the basis of the much of the I-131 report. Other toxicants of concern also need to be addressed.

Note was take that the contamination from fish ingestion will not necessarily be measurable in the blood stream at high levels at all times, a challenge test is needed to detect it. This was not used by ATSDR and is not normally used in a standard physician's office visit test. It was reported that ATSDR formerly was chartered to set up health intervention clinic until Congress changed this 7-8 years

earlier. That can be changed back; the Subcommittee was urged to recommend that, and to end “paralysis by analysis.”

The ability of a clinic to provide data to the little available on additive or synergistic effects of contamination was noted.

An e-mail letter to the Environmental Quality Advisory Board was read from a person planning to move to the Oak Ridge area and worried about its environmental safety. The EQAB Chair’s response was shared, reassuring him of no immediate threats to public health from the ORR, “unless surveillance and maintenance lapses occur and cleanup fails to occur.” However, a member of the public disagreed, citing the potential of mercury vapor contamination from the incinerator.

Review of the state Health Department’s gathered public input was advised.

A charge was lodged that the iodine release reports have been watered down.

Allowing an alternate member for a member who is ill was suggested.

The different issues of the workers from those of the residents were noted. The perspectives of both ill workers and residents should be represented on the Subcommittee. The meetings would be improved by being less dominated by federal agency staff and certain committee members.

**New Business** included ATSDR’s report of a planned *Team Building Training Workshop* for the Subcommittee members at the Children’s Defense Fund Lodge in Clinton, on July 31. Alternative dates are also being explored. In **Old Business** a motion to *table the topic of an ORRHES Vice-Chair* indefinitely was unanimously carried. The *applications for the ill-worker ORRHES member* are now being considered. That seat will be filled when the federal hiring freeze is lifted. Noting that at almost every meeting there is public comment about no ORRHES member identified as a person ill with ORR-related health effects, ATSDR was advised to *develop a collective biography of the Subcommittee* to challenge those comments without needing to force anyone to self-identify. In addition, the members were united in a general feeling that the Subcommittee needs to exercise every effort to *make the public feel welcome* and as included in the meeting as possible. A motion to open the nomination process and to give preference (not exclusionary priority) to a sick resident as carried.

In **closing comments**, one member suggested setting a different meeting time outside of working hours, such as the evening, to encourage public attendance. However, it was noted that evening hours are ill-suited for the skilled craft workers, for example; and another member commented that the Subcommittee and Workgroups had already strenuously adjusted schedules to have meetings at times convenient to most people. Finally, ATSDR’s new phone numbers and members’ new e-mail addresses were shared. The members who volunteered for workgroups were again asked to attend either in person or by conference call, to help the workgroup attain a quorum. The members also were again asked to be conscious of the need to maintain a quorum during Subcommittee meetings.

The action items, motions, and recommendations from this meeting are attached to the meeting minutes.

**Department of Health and Human Services  
Agency for Toxic Substances and Disease Registry**

**Minutes of the Meeting of the  
Oak Ridge Reservation Health Effects Subcommittee  
June 11-12, 2001**

**JUNE 11, 2001**

The Agency for Toxic Substances and Disease Registry (ATSDR) and the Centers for Disease Control and Prevention (CDC) convened the fourth meeting of the Oak Ridge Reservation Health Effects Subcommittee (ORRHES) on June 11-12, 2001. The meeting, which was held at the Oak Ridge Mall in Oak Ridge, Tennessee, was begun by Chair Dr. Kowetha Davidson at 12:32 p.m.

Members present were:

Alfred A. Brooks	Jerry Kuhaida
Robert Craig	James F. Lewis
Kowetha A. Davidson, Chair	Lowell Malmquist
Robert Eklund	L.C. Manley
Edward L. Frome	Therese McNally
Karen H. Galloway	Donna Mims Mosby
Jeffrey P. Hill	William Pardue
David H. Johnson	Barbara Sonnenburg
Susan A. Kaplan	

Members Mr. Don Creasia, as was Mr. Charles Washington on June 11. The resignation of Dr. Ron Lands was regretfully announced, due to a change in his practice and schedule.

Ms. La Freta Dalton, Designated Federal Official (DFO) and Executive Secretary of the Subcommittee, was present.

All the liaisons to the Subcommittee attended:

Elmer Warren Akin, U.S. Environmental Protection Agency (EPA)  
Brenda Vowell, R.N.C., Tennessee Department of Health  
Chudi Nwangwa, Tennessee Department of Environmental Conservation (TDEC)

Agency staff present were:

ATSDR: Bert Cooper; William Carter, Greg Christenson, La Freta Dalton; Michael Grayson, Jack Hanley; Karl Markiewicz; Bill Murray; Therese Nesmith; Marilyn Palmer, Jerry Pereira.

DOE/Oak Ridge Reservation: Timothy Joseph  
Tennessee Department of Health, Office of Minority Health: Robbie Jackman

Others present over the course of the meeting included:

David Hackett  
Owen Hoffman, SENES  
Bill Moore, Tennessee State Epidemiologist  
Norman Mulvenon, LOC/CAP  
Dwight Napp, Save Our Cumberland Mountains  
Grace Paranzino, MCP MCP Hahnemann University  
Robert Peelle  
Debbie West, court reporter

**Opening Comments.** Dr. Davidson welcome the attenders and thanked the Department of Energy for the tour of the ORNL facility provided that morning. The Subcommittee members briefly stopped by the graphite reactor, site of lithium separations process and the smoke stack associated with the those releases; the area of the underground Gunite tanks now being cleaned, the intersection of White Oak Creek and the Clinch River; the Solid Waste Storage Area #4; the molten salt reactor, and the cesium plots. Dr. Davidson also reported a meeting of the Workgroup Chairs, and their discussion of the COSMOS recommendations presented at the last meeting. Designated Federal Official Ms. Lafreta Dalton also welcome everyone to the ORRHES meeting.

Dr. Davidson reviewed the agenda and drew the members' attention to inclusions in the meeting materials: a glossary of terms from ATSDR and the final draft of ORRHES Bylaws. No comments were voiced about the minutes of the March 2001 meeting, which were approved. Most of the action items listed therein had been accomplished. The minutes from April 24<sup>th</sup> conference call were also approved.

### **Presentation of the ATSDR Division of Health Education and Promotion**

Dr. Greg Christenson, Acting Director of the Division of Health Education and Promotion, discussed some of the issues addressed by the Division and its work at the Oak Ridge site. The Search Committee for a permanent Director developed a list of candidates for ATSDR Assistant Administrator Dr. Henry Falk. They will be interviewed between July 5-20, after which a new Director may be named. Dr. Christenson is not a candidate. He noted the importance of continuity to this community, and reassured the Subcommittee members that ATSDR's activities at Oak Ridge are part of the Division's core program, and will be done. The establishment of the ATSDR office in Oak Ridge is just one indication of that commitment.

Dr. Christenson provided an overview of the Division. Its has three Branches:  
The *Risk Communication and Research Branch* conducts case studies in environmental medicine that update physicians on the latest science and its clinical

applications. About 33 case studies are complete now, and 4-5 are in development. For example, a current study in development is on iodine-131 (I-131), which should be available to be part of the George Washington University (GWU)/MCP Hahnemann University-developed Provider Education Program at Oak Ridge. Most are topical, focusing on a specific toxin or chemical, but others are more general, such as one for physicians on how to take an environmental history and another on the application of environmental health to the pediatric field.

The Health Education Branch, in which Ms. Nesmith works, develops strategies, models, and materials for educating populations in general as well as physician and provider education materials. These two Branches work together in a process to allow outreach to community members and providers to provide the information that they need.

The Health Promotion Branch conducts environmental health intervention programs, including the needs assessment being done at Oak Ridge by GWU. That is expected to result in a work plan to direct future activities to help this community, and help ATSDR's other Divisions to support those activities. Oak Ridge has the potential of using many ATSDR resources. Those processes are beginning, but as often happens, things seem to take a little longer than expected.

*Discussion* included:

Mr. Lewis: *What are the various components of the work plan, and how does it interact with the needs assessment?* This is a health education work plan that will be developed from the analysis of the needs assessment's information, derived from the telephone survey, focus groups, and key informant information. Using that information, educational strategies will be designed to intervene to provide the necessary information for the special needs of subgroups or the population in general. The basic work plan will evolve from the health education requirements and the needs assessment, and the basic science done by the Division of Health Care Assessment and Consultation in developing of the health assessment.

Dr. Brooks: *Can you provide information useful to develop a program of work to address contaminants of concern, and a loose timetable for the ORRHES meetings at which these will be discussed, for the Health Needs Assessment?* We can develop a time line for the needs assessment's conduct and analysis, in general, but some things cannot be controlled (e.g., other people's schedules, and Institutional Review Board [IRB] approvals). Dr. Brooks expressed the Subcommittee's understanding that this would be a living document with likely slippage, and agreed to provide the style developed in order to have such a guidance document ready for the next committee meeting. This is not ATSDR's longer program of work document, just a brief 1-2 pager to identify the tasks on a time line.

Dr. Malmquist: *Can you assure us that this health needs assessment will focus on the environmental impact from the reservation upon the general population?* The ATSDR is not looking for general chronic health problems such as cardiovascular disease, but for health issues related to potential environmental hazards in the community

Dr. Brooks: *This community distinguishes between environment hazards related to the Oak Ridge Reservation (ORR) and environmental hazards in general. Dr. Paranzino will most likely address issues of general concern environmentally and specifically target those that this community would focus on.*

Mr. Lewis: *In releasing messages, the major components of developing the work plan of the assessment process should be explained in a little more detail in layman's terms; and what will be the components of that educational piece, to community, physicians; using television?* All the necessary information will be released on a fact sheet which should be ready relatively soon. But the information transfer process is complicated, requiring not only physician but also community training, so the latter can ask and respond to appropriate questions with their health care provider. Education for both groups will be pursued. The environmental health care intervention program will involve on-the-job training for local practitioners in which clinically experienced, environmental health experts share in seeing their patients who may have diseases related to environmental issues. This paradigm has been demonstrably successful in chronic disease (e.g., breast or cervical cancer screenings) and are hoped to be similarly helpful for environmental health applications.

Mr. Lewis: *What is our status as a Subcommittee relative to some of ATSDR's other sites?* Several sites are experiencing this strategy of community and health care provider education, so determination of the program's effectiveness is still pending. At least anecdotally, linking educators and communities in implementing this strategy is an effective method, even in the environment health area.

Dr. Brooks: *How will ATSDR address the problem left in the community, if the study cannot prove that the health concerns they believe are ORR-associated?* That is a complicated issue. Historically, it may well be that the health assessment will find association between ORR contaminants and the city of Oak Ridge's health problems. Education can not do everything, but it might be able to reduce the stress level and help provide more realism about what the potential conclusions may be. A federal agency can only do so much, and is limited in its ability in a short period of time to address the community's long-developing perception of effects may have resulted from the reservation's work. Some members of the community will not be satisfied with how ATSDR addresses that. But the best it can do is to provide the most accurate, most reflective response to the information gathered, to help the community at least understand what science knows and does not know at this point in time.

Dr. Brooks: *Will you stick around for a little while and help us allay these fears, not forever, but long enough for a reasonable effort to convey the findings through the community?* ATSDR is committed to stay at the site to do the health assessment and what is necessary to explain its results, and to be certain the processes are all completed. This as a priority site. ATSDR will remain as long as a reasonable contribution is being made.

## **Update of the Health Education Needs Assessment**

Dr. Grace Paranzino, of MCP Hahnemann University, updated the Subcommittee on the status of the Health Education Needs Assessment being conducted by George Washington University (GWU) and Hahnemann. They revised some of the survey tools after the last IRB meeting, which will remain in draft format pending feedback from the Subcommittee, after which they will be resubmitted for the IRBs' approval. The latter are necessary to ensure that the study is ethically conducted, scientifically founded, and properly budget. The Tennessee Department of Health also has asked to see them. Work remaining includes the key resource interviews, telephone survey, focus groups, and final report. The questionnaire format has been completed, and is in review by the various IRBs.

The *key resource interviews* will begin in mid-June and be completed some time in July. The geographic areas to be sampled by the telephone survey was narrowed with the Subcommittee's help; the exchanges to be called were identified, and random numbers in each will be called in August. The survey question draft is completed. About 400 people will be surveyed, which may well require ~1200 calls. The initial screening questions will help identify those willing to participate. GWU/MCP Hahnemann will submit any final suggestions from the key resource interviews back to the working group for approval and then modify the survey as needed. The *focus groups*, defined with the input of the key resource interviews and the telephone surveys, will be held in September. They will involve the different subsets of the population that have issues of concern and focus on the health effects and health education needs related to the ORR, along with a few general questions.

The target date to complete the health education needs assessment is the end of December. The final report will be forwarded through the Workgroup to the Subcommittee and ATSDR for comments, revisions and modifications as needed.

*Discussion* included:

Dr. Brooks: *Please translate your time to line to the Subcommittee meeting dates at which these things will be reported. And, will you screen the effects of the environment pollutants from the Kingston and Bull Run power plants, whose interaction with the ORR pollution concerns many people? If they are conceived as being a part of the overall ORR picture, GWU/Hahnemanns would need to separate that out.*

Dr. Brooks: *Is your "work plan" part of the ATSDR plan? Yes, the health education action plan is to define what people want to know more about regarding health education, to identify the forces involved (i.e., resources that will facilitate the process or that need to be developed); and how to get that information out the community and health care providers, including alternative strategies if limited resources require them.*

Dr. Brooks: *Does the action plan derive solely from the health needs assessment,*

*or is there input from the health assessment?* Dr. Christenson answered, both; it will be a joint effort by the Division of Health Assessment and Consultation and the Division of Health Education and Promotion.

Dr. Davidson: *Is the health education action plan part of the December report?*  
Yes.

Mr. Lewis: *Will there be one or two sets of questions in the screening process, one to screen people out and another of detailed questions? Sharing the screening questions would help alleviate concerns about what is being targeted.* GWU/MCP Hahnemann have no problems sharing the general theme of the questions and how they will be asked, but they cannot be a public document for fear of biasing the process.

Mr. Lewis: *What were your opinions/conclusions from the documents reviewed, and how will they be used? For example, from where did such reports as the one on community diagnoses originate? How will they be used?* Many surveys have been done of the ORR area, all of value in some way. GWU/Hahnemann's role is not to critique them, but just to see what they offered that might benefit this work. Some of that work's methodology was similar (e.g., focus groups and telephone surveys), but most of those focused on general parameters or general indicators of health in Oak Ridge and surrounding communities, as opposed to this project's tailoring it to be more specific to the ORR.

Mr. Akin: *How will ATSDR respond to the comments on the December draft report? Could they initiate more work?* It depends on the comments. The responses would not necessarily be individual; GWU/Hahnemann would respond to the comments and direct them either to the Workgroup, the Subcommittee, or ATSDR. If the comment defines a limitation that cannot be corrected, that is acknowledged; more research could be a Subcommittee recommendation to ATSDR.

## **Public Comment**

*Mr. David Hackett* is a local professional engineer in private practice. Confusing this Subcommittee with the ORHASP, he stated that ten years of this committee's work and dose reconstruction had produced far too little. He respected Dr. Hoffman's attempt better understand "the mess here in Oak Ridge," but in his opinion, rather than science, the work done here has been a smoke screen to confuse the public. Aside from I-131, the public has not been reassured that they have not been exposed to carcinogenic levels of uranium, fluorine, nickel, arsenic, mercury, chromium, neptunium, plutonium, or beryllium. He called the work done to date pseudo science done with randomly selected exposure standards and falsified reported data. He was convinced that it was a malicious ruse by the government to convince the community it has been protected all along. Oak Ridge knows better.

He condemned "the scoundrels whose ... opinions are for sale to the highest bidder" to protect actions of the past and termed the I-131 study "trash." He called for closer scrutiny

of where the data originated from. In his opinion, what Oak Ridge needs and has asked for is a health study to show the exposures have been, and health care for those already sick and dying. He cited increased local cancer rates and the disruption of many area residents' immune systems. He asked rhetorically, If it is so safe, why millions are needed to clean up the environment. He charged that exposure standards treat exposed humans as canaries were in the mines. The human response is such that on the bell curve, only a few sensitive individuals will be harmed (the canaries). It took two million "canaries" getting sick to lower the standards. He called for an end to cover-ups of toxic exposures and real study of the health effects of low doses that display no overt symptoms for years but continuously undermine the immune and central nervous systems. He felt that any decent scientists with expertise will willingly acknowledge how much they don't know as well as what they do, and those who speak knowingly and confidently "... are certainly full of (manure.)"

Dr. Davidson requested that the public commenters remember the codes of conduct for the meeting and asked Mr. Hackett to provide his written comments.

*Ms. Janice Stokes* thanked the members for their service. While she respected the members, she had more of a problem with the past actions of ATSDR, CDC, and DOE, the source of much of the anger heard, regarding their scientific methods and the truthfulness of the documents used. She urged the panel to not accept everything provided by ATSDR as acceptable science. She also requested that public comment be allowed in the presentations by Dr. Hoffman, Dr. Widner, and Mr. Hanley, as well as throughout the meeting, so that the public who cannot wait to the specified comment periods have an opportunity to speak and ask questions on the record. Such a procedure would allow the full history of events to come out.

Dr. Davidson responded that that format had been considered, but the Subcommittee wished to avoid losing the time for full presentations and preserving time for questions. The entire agenda could be disrupted by getting caught up in questions during the presentations. In addition, four presenters were scheduled over four hours to allow time for questions. If they speak for less time, discussion is possible. Ms. Stokes asked why the Subcommittee even bothers to have the public come, if such a controlled environment is desired, and noted that there is no affected citizen on the panel.

### **Task One Report, Tennessee Oak Ridge Dose Reconstruction Study**

The State of Tennessee's Oak Ridge Studies, July 19, 1999, Task One Report, was presented and discussed, focusing on the technical issues of the dose calculation, risk estimates, probability of causation, excess cancer, and thyroid cancer analysis. The discussants were Dr. Tom Widner, of JA Jones Environmental Services; Dr. Bob Peelle of the ORHASP; Dr. Owen Hoffman, of SENES Oak Ridge; and Dr. Michael Grayson of ASTDR.

Mr. Jerry Pereira of ATSDR noted the unlikelihood that anyone's opinion would be changed by these presentations on this day. He commented that the purpose for this panel was for the Subcommittee to collectively listen, learn, and perhaps make some personal judgments; and then to proceed with it work. He hoped that listening from that viewpoint would everyone to have a better perspective on the information.

**ORHASP Perspective.** Dr. Robert Peelle began with the study's background. The State of Tennessee commissioned a study of potential offsite health effects from the ORR, which DOE agreed to fund and which began in 1974. One of the priority contaminants determined by a feasibility study was radioiodine from the Radioactive Lanthanum (RaLa) process. The ORHASP Committee was reorganized during this project. The ORHASP was a committee of citizens and experts, which monitored the progress of the study and interacted with the interested public who attended their meetings. Their activity ranged between active oversight and passive review.

The panel had no interest in judging the DOE or the Atomic Energy Commission (AEC), but only to determine the facts. They pushed for a serious records search to explore anything related to potentially hazardous off-site releases. Over time, the DOE policies changed and they cooperated in searching for records. The panel also strove to produce unbiased risk estimates and to be respectful of the public's concerns. They explicitly considered the variability of the individuals affected (age, weight, size of thyroid gland, etc.) by approximating the variables' distribution of density, function, and frequency in the population. They then combined all the data available in a Monte Carlo analysis to determine the 95% confidence level. That is, the actual truth could be 5% higher or a little lower, lying within the ends of a confidence interval.

The confidence limits were so defined because there is no evidence that the median value is either the real or the best answer. This is because many of the parameters in the analysis offer little data, and because it is not certain that the best value was estimated. Finally, the panel assumed that the doses had no threshold for excess cancer risk. They addressed what appeared to be the most important pathways of contamination, and set the lesser ones aside for later study.

**JA Jones Perspective.** Dr. Tom Widner, who was the Project Director of the work described by Dr. Peelle, provided more detail. The initial feasibility study reviewed Oak Ridge work from the beginning of the site's operations, and identified four materials of concern. The dose reconstruction explored those, fed by a systematic document search. The final deliverables of the Oak Ridge dose reconstruction were the draft and final task reports, a nine volume set; the ORHASP report; and a project summary which briefly covered the whole project and offered sample exposure scenarios to demonstrate how people could have been exposed to multiple contaminants over time. The Tennessee Department of Health Website has extensive information (he also brought hard copies to this meeting), and many of the source documents will soon be available on the Internet.

Dr. Widner focused on the RaLa process, which resulted from Dr. Robert Oppenheimer's request for it to help Los Alamos' early weapons explosion design testing. The source material for this radioactive lanthanum was radioactive barium 140, which was made in Clinton, in the Oak Ridge area. At Los Alamos, a round sphere containing the lanthanum was exploded; the lanthanum's very high gamma rays were used to measure the timing and uniformity of the implosion.

*RaLa Process:* The RaLa processing was the dominant iodine source due to its short cooling time and the large number of barium slugs processed. Natural uranium was placed into a reactor and divided into fission products, including barium, which decayed to the lanthanum 140 desired by Los Alamos. In the RaLa processing building, those fuel solutions were quickly dissolved in nitric acid (due to barium's short half-life). This process also released other fission products such as I-131. The iodine-to-pasture pathway was still unknown at that time, and little environmental or process sampling for iodine was done.

Lanthanum processing emission points included: 1) the caustic scrubber, which was designed to reduce the acid vapor emissions, but may not have reduced the iodine as well, and 2) the processing equipment itself, which was used well beyond its design capacity. Designed to make 1000 curie batches of barium, they instead made up to 65,000 curie batches without upgrading the equipment.

The study screened out I-133 as a contaminant of concern when it was found to not have elevated the ingestion pathways. That was supported by a systematic document search of ~40 record repositories and interviews of current and former workers. The Clinton processing lines were prioritized because they involved large amounts of nuclear fuel with relatively short decay times, or had well-documented instances of off-site contamination before the off-gas treatment systems were perfected at Oak Ridge.

*The source term* is the quantity released, its timing, and the forms of the release. The records provided a chronology of ~80 RaLa batches. The study calculated how much iodine was within each of the fuel slugs. Some decay occurred between the 2-14 hours between removal from the reactor and its placement in the dissolver, but the slugs from Hanford took 5-6 days to transport. Original operations and health physics logbooks enabled classification of each dissolving batch, based on how likely its releases were to have bypassed the caustic scrubber. In some cases, the leaks were so strong that the operators had to wear respirators to complete the run.

The RaLa process was unpredictable. To compensate for the lack of monitoring, the study estimated iodine behavior in the system in several ways: expert opinion, modeling of the process, and the experience of other sites. The iodine species in the dissolver was thought to be either elemental, organic, or particulate iodine form. They estimated the mixture of iodine isotopes in the dissolver, how much was released to the gas removed from the dissolver to the scrubber and the stack, and how much was left on the scrubber.

Dr. Widner outlined some the expertise of those who were consulted.

There were virtually no measurements of the iodine species in the dissolver, but they estimated it to be 94-99% elemental and fractional amounts of volatile organic, non-volatile, and particulate forms. Oak Ridge did not use any organic reagents in the process, so only trace organic iodine was thought to be present. The scrubbers were supposed to be 99% efficient in capturing the elemental iodine and 1-10% efficient for the volatile organic and particulate forms. A scrubber model that was developed estimated 99% capture efficiencies for the scrubber when the caustic solution was used. When water was used instead, the efficiency was lower by a factor of ten.

However, the study experts consulted thought those collection efficiencies to be overestimates. Based on Oak Ridge monitoring studies and scrubber experience at other sites, and a RaLa monitoring study done at one point in time over the 13 years, they concluded a 90-99% efficiency for elemental iodine and 50-99% when water was in the scrubber. Particulate releases were estimated from processing stack sampling data.

Modeling of the elemental iodine releases estimated a line loss of 20-70%. The well-documented line problems prompted the study to increase the line loss factor. The elemental, organic, and particulate releases were summarized. The modern-day annual intake limit is .0005 curies. Much higher releases were documented in 1954 during an uncontrolled release that lasted from one-half to four hours. However, these releases ended up to be a very small fraction of the routine releases (280 of 21,000 curies normally released).

Elemental iodine can break down the presence of sunlight to form other forms of iodine; organic iodine does so at a much slower rate. So, the most important chemical transformation would be from elemental to organic iodine, a transformation the dispersion model took into account. However, organic or particulate iodine remains in those forms while traveling to the receptor. Depletion or reduction could occur during wet deposition (washed out of clouds by rain and dew). Dry deposition was also modeled with what meteorological data were available. Some hourly data could be analyzed as well to develop a statistical set of probability distributions for each month and each hour of the day by wind speed, direction, and atmospheric stability.

*Deposition* is a parameter that describes the iodine's rate of transfer from the air to the surface of ground or vegetation. The ratio of the air concentration to the deposition flux, to the ground or to the plants, is called velocity of deposition. There was good such data for the time of the 1954 accident, which was modeled for the 38 kilometers around the X-10 central stack. That area was divided into sixteen directional segments or sectors, with about 25 distances in each direction, in a dispersion grid.

The air dispersion model was validated with monitoring data available from 1967 to 1969

at nine sampling stations near or on the reservation, which were compared using the ISC and IAC models. The study's model results were within a factor of two of the observations, and the other models were within a factor of three. That indicated the model's adequacy for estimating routine releases of iodine from X-10.

To estimate short-term releases, health physics reports of specific iodine curies released were compared to the modeling results. For two episodes, the model prediction and actual measurements were within the 95% confidence interval; the model under-predicted other episode. Appendix 11 of the study report provides the dispersion model's detailed concentration estimates for the study domain and the estimated concentrations in the other environmental media.

*Vegetation* deposition is important for iodine. The literature provided parameters with which to estimate the behavior of iodine released on vegetation, and there were some field measurements of deposition velocity. Those, with available rain data, produced deposition distributions over time, correlating precipitation data to the routine releases. The transfer from pasture to food/milk was then calculated. Some validation of predictions of iodine concentration in milk were done with milk measurements from 1962-64, compared to the monitoring stations' measurements. Almost universally, the average measured concentrations were in the predicted 95% confidence level.

*Distribution of food products* was accounted for (time lapse of milk/food processing to delivery) in the reduction of iodine concentration in the consumer, based on literature reviews and interviews. Food intake by humans was estimated for different age groups and genders, and for inhalation. Internal dosimetry is enabled by standard calculated dose coefficients to the thyroid gland for a given intake of I-137. The mass of the thyroid gland was a key parameter in calculating the dose to the thyroid. The smaller the mass, as in children, the higher was the energy deposited per unit mass and the dose. The dose factors were also recalculated in uncertainty analysis to try to determine which parameters of the dose calculations most contributed to the overall uncertainty of results. Ultimately, the data indicated that the smaller thyroid mass was offset by the faster clearance time of iodine from the thyroid glands. In the end, the study's calculated dose factors were very close to the calculated dose factors of the International Council for Radiation Protection (ICRP).

*Calculation of Excess Risk.* Next, the study examined thyroid risk per unit of radiation dose. The literature has established that x- and gamma radiation of the thyroid causes thyroid cancer as well as adenomas to people exposed under age 15. *Relative risk* is a factor by which the background risk of cancer is increased by a given iodine dose. *Absolute risk* is an average number of cases of thyroid cancer observed above the expected amount for ten thousand person-years of exposure.

The sources of relative risk factors were defined for young children (<14 years) came from

the 1995 National Cancer Institute (NCI) study of Ron et al; the atomic bomb survivor studies provided those for older adolescents aged >14 years. The studies showed no effects exposure above age 40. Females are generally more sensitive than males.

*Modifying factors include* the relative effectiveness of I-131 compared to external radiation by X- or gamma rays, and age at exposure (e.g., 1.0 for children aged <5, .2 for those aged 10-14 years, etc.). Those most exposed are those aged <5 years. Above age 14 involves a different relative risk factor. Females are .2 to five times as susceptible as males. Each value between .2 and 5 had its own probability; and compared to external radiation, iodine ranged from equally effective to five times less effective.

*Background risk* was determined with the Tennessee Department of Health's thyroid cancer incidence rates from 1988 to 1995 for all Tennessee counties except the four counties around Oak Ridge. Most thyroid nodules are benign, and ultrasound finds more nodules than palpation of the thyroid glands. But since only ~28% of thyroid cancers are diagnosed and reported, the total possible cancers could be 3-4 times the number estimated in this study, based on clinical diagnosis. There is evidence of radiation exposure's association with non-neoplastic thyroid diseases such as autoimmune hypothyroidism. These are discussed in the report, but the incidence rates of benign tumors or autoimmune diseases were not estimated.

*Other variables* were reflected in the study report's contour data plots of concentrations in the environment media; locations, age, and gender of the receptors, and diets (four were modeled, including those who drank cow's and goat's milk). A plot of thyroid cancer for people born in 1952 who ate local produce and drank a backyard cow's milk showed a pattern of contamination, with dose patterns roughly following the ridge and valley terrain from the southwest towards northwest. Concentrations decreased with distance out to the 38 km. The nine birth years were similarly charted to bracket the exposure, keeping in mind that RALA releases were from 1944 to 56.

At points of exposure, females born in 1952 received the highest exposure, higher for those drinking backyard cow milk. The influence of local fallout from Nevada Test Site (NTS) atmosphere weapons testing was added to the study doses. Bradbury was one of the most affected locations, with doses dominated by the X-10 releases. Its upper bound was 200 centigrays (or 200 rad) compared to the 48 from the NTS fallout.

*Estimation of health effects* included estimation of the number of thyroid cancers expected between 1950 and the year the 2020 from the contamination of milk from X-10 releases. The calculations of average time and space concentrations, volumes of milk produced in the area, and the dose and risk factors earlier described, produced an expected 6-84 excess thyroid cancers within 38 kilometers; 1-33 from backyard cow milk consumption; 14-103 excess cancers within 100 km, and 25-149 within 200 km. Most of those cancers could be expected to occur after 1970; a few could occur up to 2020.

Some changes were made to the I-131 report between November of '98 and the June 1999 final report. A written summary of all of the changes showed most of them to be typographical or made to facilitate distribution (printed, electronic), or to emphasize points. Two areas of controversy were somewhat de-emphasized: 1) non-neoplastic thyroid disease, and how strong a statement could be made about how many other thyroid effects would be expected beyond thyroid cancer; and 2) comparisons made with the Tennessee disease registry between thyroid cancer incidence for the four local counties compared to the rest of the state. A basic comparison between the four local counties and the rest of the state implied one conclusion; but when estimates of the uncertainty of observed differences in thyroid cancer for whites and blacks, and comparison of thyroid cancer rates among whites in the four counties to whites statewide, implied another conclusion.

Dr. Peelle summarized the lack of monitoring and late recognition of the milk pathways of contamination. He noted that Oak Ridge city residents and workers were not highly exposed at work because the air inhalation was not the important pathway. Only those aged 5 and drinking a lot of milk were at high risk, particularly those who drank goat's milk. There was a large range of risk. Some thyroid cancers occurred, but most were within 25 miles, even though the highest-risk individuals were right across the river. The large number of exposures at a lower risk related to most cancers, which total perhaps a couple of dozen. That is the scale of the problem. Finally, he stated that the threshold of risk from a radiation dose to the thyroid would not be a very large problem because the risk was very small for a large number of people. Nonetheless, the study assumed that there was no threshold of risk, the conservative path.

The ORHASP issued nine recommendations, most dealing with the study's body of work. But the first recommendation, thought by most of the panel to be the most important, pertained to communication to the public and their perceptions of the problem. The residents' concerns often appeared unrelated to the most significant releases identified. A series of initiatives and public health activities were recommended: ensuring that physicians get information so that they can look for thyroid problems; strong consideration of a clinic to evaluate those who may have been affected; and advice against doing an epidemiological study of some of the contaminants. The ORHASP members remain fairly certain that this is not a feasible study, even though they are convinced that there have been thyroid cancers. They believe that meaningful results will be prevented by either a large cohort diluting the number of risk-associated cancers, or such a small number at high risk that there would not be enough study power to detect the association.

*Discussion*, held after a short break, included:

Dr. Eklund: *How did the release estimates change during the I-131 project?* Dr. Widner: The final report describes the decline from the 1996 rough screening assumption of an 80% iodine efficiency capture, through more detailed analysis of, principally, the scrubber efficiency using the uncertainty analysis of the Monte Carlo assessment.

Mr. Manley: *What happened to the workers involved in the X-10 and Hanford incidents?* Those in the building immediately left and stayed away at least 12 hours due to high radiation levels. Thyroid counts on those workers have been reviewed, but there was no evidence of long-term follow-up found. Dr. Peelle was present that day, and reiterated that iodine most affects children under age 14.

Ms. Sonnenburg: *Where did the figure of 28% of the total thyroid cancers in population being diagnosed and reported come from?* That is a nationwide average. Dr. Hoffman added that this information comes from the Institute of Medicine (IOM) in Washington, D.C., which reviewed the National Cancer Institute (NCI) study on I-131 and fallout. They found that diagnosis of existing thyroid cancers in a population depends on the physician's practice (the common physical palpation of the neck or ultrasound). But the ratio between what is diagnosed and what actually exists in a population comes from autopsy data. Many people who have thyroid cancer die of something else.

Dr. Frome: *What kind of assumptions about the distributions and the various risk groups in the geographic area did you make in doing your calculations of excess risk?* The assumptions include what the amount released and what fraction of contaminated milk was consumed by children under age 15, regardless of where they lived, to produce a reasonable estimate of the expected excess cases, and the assumption that over age 15 the risk is markedly less. Dr. Frome: *How do you know that the parameters for children would differ from those for adults?* That isn't known, exactly; the range of scientific confidence is known, which is expressed as an uncertain variable. But the main difference is in the mass of the thyroid; any other metabolic difference between children and adults is small.

Dr. Brooks: *There appear to be inconsistencies in the report about the scrubber,* regarding practices, and that the sparse performance data provided is experimental data that lies well outside the assumed range of distribution function for scrubber efficiency. This ignoring of book parameters, without any definitive discussion of why, raises questions. And, the Knoxville reference diet is urban, with no backyard cows, differing from that of rural areas such as Oak Ridge. *What difference would the predicted rates be with a more exurban diet.* Dr. Peelle responded that the diet was not Knoxville's, but commercial milk, and in 41 locations. Average numbers are given for commercial milk from the region.

Ms. Stoke objected that commercial milk in this area *came* from backyard cows; in fact, some of Knoxville's milk came from her grandfather's farm. And even today, metropolitan areas still have local producers. *She asked if the tumor registry data was available to the public?* Dr. Bill Moore, the Tennessee State Epidemiologist, reported that the cancer registry is alive and well, but is 3-4 years out of date. It is updated every day, but this a passive surveillance system that depends on voluntary reporting by institutions and physicians. Delays in reports are normal. Requests for information should be sent to Dr. Tony Bounds, who is in charge of the state registry, in Nashville.

### ***SENES Perspective***

Dr. Owen Hoffman was the task leader for the I-131 study, which took four years to do. The final report on the I-131 task was delivered by the City of Oak Ridge to the State of Tennessee in November 1998. Since then, SENES has put the report contents in a computer code, which he demonstrated.

But first, Dr. Hoffman discussed the health implications of combined exposure to multiple sources of I-131 other than the RaLa releases. He defined the measurement term of one rad as 1/100 of a Gray, or one centiGray. A very high dose of about 2000 centiGrays, the dose used by therapeutic medicine, can destroy the thyroid gland. The patient takes hormone replacement for a lifetime to offset hypothyroidism. The only environmental examples of such thyroid destruction are the few children on Rongelap, Marshall Islands, who in 1954 were exposed to fallout from Shot Bravo, the highest iodine exposure event known. At lower doses (<100 cGy/rad), thyroid cancer or benign thyroid growths called neoplasms can occur. The greatest risk is in females, especially those exposed in childhood, and to children in general. There is a 90% survival rate 20-30 thirty years after thyroid cancer treatment; it is seldom fatal.

The limits of epidemiological detection (ability to find an effect that is truly present) is between ~10 and 30 cGy. But the inability of an epidemiological study to detect below these levels does not mean that the risk is zero. The recent literature indicate that the risk for I-131 is not much different than any other type of radiation in inducing thyroid cancer (as seen in NTS and Chernobyl exposures). Epidemiological studies' statistical power is compromised due to the very high uncertainty of the dose estimate, and low statistical power most likely prevents the ability to see an effect. The NCI recently agreed that the weight of uncertainty leans toward no difference at all for I-131 than from other radiation exposures; that there is no dose below which there is no risk; and that the risk markedly decreases with increasing age at exposure, with only a small difference due to gender. The NCI's updated epidemiological tables parallel the confidence intervals of the risk factors for excess risk per Gray found by the Oak Ridge dose reconstruction, and recent epidemiological data of children exposed to the NTS fallout and Chernobyl are similar.

*Other health outcomes from exposure to radiation* include non-cancerous growths to the thyroid and benign nodules; thyroid function diseases such as autoimmune thyroiditis, such as Hashimoto's hypothyroidism (under-active thyroid) or Graves Disease (over-active thyroid). In some cases, these affect the quality of life more than thyroid cancer. The IOM's summary of the evidence indicated that the risk of autoimmune thyroiditis can occur at doses <100 cGy, but it is unlikely at <10 cGy. Therefore, the elevated risk is plausible at a range of 10-100 cGy.

*Sources of I-131 exposure* include medicines, nuclear facility releases (especially from accidents), and nuclear weapons testing. SENES believes that the release estimates

from Oak Ridge should include the caustic scrubber and X-10 releases and be raised. In addition, Hanford released ~900,000 Curies (Ci) of I-131 (a curie is 37 billion disintegrations of radioactivity per second; the international unit is the Becquerel, one disintegration per second). The Savannah River site released ~65,000 Ci in the most recent estimate; Chernobyl released ~50 million Ci; the NTS released 150 million Ci and the Marshall Island testings released ~8 billion Ci. The amount from the former Soviet Union has yet to be totaled.

About 100 atomic tests were detonated in the atmosphere, from towers, tethered balloons, or test sites. Depending on the height of the mushroom cloud, the wind carried these clouds in different directions, but mostly to the east. The U.S. depositions were estimated by mathematical models from the deposits on a gummed film network, 8½x11" sheets of paper placed at breast height and changed daily. The models calculated the gross beta activity to how much I-131 would be in air, and then adjusted for local amounts of rain (which aided deposition). The measurements in the gummed film areas are more certain than those a distance from them. Fallout raised radiation background exposure substantially, and that occurred at the same time as the X-10 releases.

Dr. Hoffman showed the NCI's map of the U.S. with the average I-131 dose per person for each U.S. county. Most of the dose appears to be in the west and some in the northeast, but it focuses on the average individual and the average date. The map of those who were children at the time (born in 1946) and drank milk showed no counties with an average dose of >30 rad; 130 counties with 10-30 rad exposure; 1,600 counties between 3-10 rads, for children born in 1946. But the same counties, for children born in 1952 who also had average milk consumption, showed six counties with an average dose of ~30 rads; 914 at 10-1000 rad; and 700 at 3-10 rad. And those with the same birth date but drinking higher-than-average amounts of milk, 236 counties had an average dose of 30 rads; and 1912 had doses at 10-30 rads.

The Oak Ridge dose reconstruction was the first to add in the impact of NTS fallout. The map of Tennessee, initially seemingly unaffected, is included in the >3 rad county dose. That dose is high enough to induce auto immune thyroiditis, particularly if a child drank goat's milk and to a lesser extent backyard cow's milk, regardless of the location of residence. Fallout exposure alone places one into the risk range for auto-immune thyroiditis.

With that, Dr. Hoffman demonstrated the updated SENES dose and risk calculation program for combined exposures locally. It included I-131 released from X-10, the original estimates from the dose reconstruction, the caustic scrubbers and other ORR releases; and the NTS fallout, but not that from the Marshall Islands or the former Soviet Union. It follows the milk pathway and estimates probable doses with a Monte Carlo simulation. The latter produces subjective probability distributions for each uncertain parameter, through a mathematical model that produces alternative realizations of the true (but

unknown) value of the thyroid dose, and eventually of the thyroid risk. Its result is expressed in the 95% confidence interval of one central estimate. The program, IRAD, or Interactive Risk and Dose Calculator, is a prototype, which Dr. Hoffman hopes to put on the Web for public access. IRAD does not yet address the additional contribution of leafy vegetables or cottage cheese, but those can be added.

He used the program to calculate the dose to a Bradbury resident who was female and born in 1952, present in the Oak Ridge area from to 1957, and drank milk from a backyard cow (the program can also calculate for regional or local commercial milk and dairy goats). The calculations showed the Bradbury NTS fallout to be less of a risk than the X-10 RaLa releases. Those are an order of magnitude higher than any regulatory standard. The excess lifetime risk for NTS fallout ranged from several chances in ten thousand up to ~2 in 100 from X-10, in a total range of ~2 chances in 1000 to 7 in 100.

From a medical point of view, these are minimal risks; a person currently free of disease is likely to remain so. But if a person has thyroid cancer, the probability of causation comes into question. That, in fact, is the main focus of the current update of the 1985 radioepidemiological tables, the estimates of which parallel the dose reconstruction's 1998 estimates. They concluded that NTS fallout alone provided an 11-80% chance of causing an existing disease; or a 26-94% chance that X-10 releases had, for a backyard cow scenario.

Dr. Hoffman did the Oak Ridge calculations for both regional and local commercial suppliers, for an average consumption of three 8-oz. glasses a day. Since most of the milk came from regional dairies, the ORR releases were diluted, resulting in lower risks than those from a backyard cow milk in Bradbury. For X-10 operations, they were again lower, ~3:10,000 chances, and an upper limit of 3:1000. The probability that an Oak Ridge resident's thyroid cancer was caused by ORR exposure is low, although NTS fallout could still be a substantial contributing factor. Dr. Hoffman then did the same calculations for local commercial milk, which raised the Oak Ridge milk dose from <1 rad to ~12, and raised a probability of causation (>50% for Oak Ridge releases). Subsequently, Dr. Hoffman calculated a dose for a member of the public, Ms. Janet Michell.

He noted that the present estimates of the probability of causation exceed the eligibility criteria recommended for compensation and care of DOE workers (i.e., the upper 99th percentile of the probability of causation exceeding 50%). That means that if the present-day rules for compensation of workers were extended to children, those who were children in the 1950s would qualify for the compensation and health care if they drank milk and currently have thyroid cancer or a thyroid nodule.

To Dr. Hoffman, this provided a sufficient basis for the Subcommittee and ATSDR to consider potential public health response, but not necessarily mass screening for thyroid disease, due to the danger of false diagnosis. But screening of a targeted population

could be done; those with thyroid disease exposed childhood and who drank milk. He also called for quantification and adjustment of the RaLa releases with regard to the caustic scrubber, and rather than using annual conditions, he would match release periods with the prevailing meteorological conditions, terrain, and time-varying releases, as well as the cumulative effect of exposure to all fallout radioiodines including the NTS, Marshall Islands and Soviet Union.

### ***ATSDR Perspective***

Dr. Michael Grayson, a health physicist and environmental engineer with ATSDR, reported their review of the dose reconstruction document and the ORHASP report of the dose reconstruction's technical matter. ATSDR did so due to interest in using these two documents in its public health assessment, and to determine if the ORHASP document was an appropriate way to communicate with the local residents. Dr. Grayson related the results of ATSDR's technical review of for both documents in a general overview.

In the *dose reconstruction technical review* experts examined at three primary areas:

The *source term analysis* was generally found to be complete and reasonable. While other assumptions could be made, the range of the risk was not thought likely to change dramatically.

The *sensitivity analysis* produced a very wide range of comments about its quality, from appropriate, to reasonable, to questionable (i.e., it should not be used further in the work on uncertainty and sensitivity analysis). That reviewer preferred to use the central values rather than the upper and lower bounds of the dose distribution. However, all the reviewers approved of the use of Monte Carlo simulations in the sensitivity and uncertainty analyses. They all called for more detail and justification by the report authors of their choice of input parameters for the code (i.e., again, preferring to use a central estimate over upper and lower bounds).

The *public health effects* conclusions were shared by the reviewers and most of the presenters this day: that doses and the risks were too small to have significantly affected Oak Ridge residents, although certain groups had higher risks (females born in 1952, people between infancy and the age of five years during the times of the releases, etc.). The reviewers found the dose reconstruction report to clearly describe the potential adverse health effects from iodine exposures, and to give a good explanation of the differences between relative or hypothetical risk and actual risk. The dose reconstruction was based on specific diets, so those risk values apply only to those specific diets.

In short, the reviewers found the methodology to meet the current standards, that the report covered all aspects of the dose reconstruction, and that generally the outcomes reported were reasonable.

*ORHASP Report Review.* Dr. Grayson then reported the comments to ATSDR on the ORHASP document, "Releases of Contaminants from Oak Ridge Facilities and Risks to Public Health". In general, all the technical reviewers found the technical information to be

well conveyed for the general public, and the recommendations to be reasonable. Improvements suggested included clarification for the general public of why an epidemiological study may not detect any increased risk; to include zero in the lower bound of the risk estimates; and to emphasize the central estimate and de-emphasize the lower and upper bounds of uncertainty.

**Committee Discussion** included the following:

Mr. Pardue congratulated Dr. Hoffman on his presentation and the model. He asked if he correctly understood that Dr. Hoffman considered the risk of thyroid cancer to be greatly increased in the U.S.; and that he basically agreed with ORHASP report except that it should include other sources. He asked *if Dr. Hoffman's estimate that this would increase the worst-case scenarios by only a factor of two or three over the few dozen found would raise total number of those affected by the Oak Ridge area releases to only 50-60?* Yes. The re-evaluation of the caustic scrubber could increase or decrease the releases, but his intuition, based on the work at Hanford and to be done in Idaho, is that the estimates will not change much. However, if the probability of causation for workers is extended to the public, small differences will make big differences in eligibility. That would be the only reason to fine-tune those results.

Mr. Pardue: *How many people might be eligible for that compensation?* Thyroid cancer is rare; about 0.06% for females over a lifetime. Autoimmune thyroiditis is very common, but not a dose response compensation matter.

**Public Comment**

*Mr. Mike Napp* asked what other I-131 releases at the Oak Ridge site were not included in the original I-131 source term? Dr. Widner responded that one not included in the evaluation, as mentioned in his presentation, was iodine isotope production processing. It was lower in relative importance because only a relatively small number of fuel solutions were fed through that process. And, since the desired end product was the I-131, they went to great lengths to capture that, so the initial evaluation found it of less importance than the RaLa processing. For the one run where the scrubber ran dry for a portion of the run, iodine would have been released; analysis did reflect essentially no removal for a fraction of that dissolving batch. *Did that occur late in the program or near the beginning the program?* The details would have to be re-reviewed, but it may have occurred late, which probably be lower in concentration. *Was the line loss accounted for in the source term?* (Yes). *So if the line from the stack to the scrubber is counted as a removal, then the median removal efficiency would ~98 ½%, right?* Yes.

*Ms. Janet Michell* asked if Dr. Hoffman wished to respond to anything in Dr. Widner presentation. Dr. Hoffman noted that one of SENES' recommendations about the dose reconstruction was to delete the early mathematical model of the caustic scrubber, which was clearly overstating the efficiency by orders of magnitude. It was not deleted, the option

of the prime contractor. SENES also objected to some changes made in the report that were more than editorial, and made without contacting SENES.

Ms. Michell commented that since 1981, hospitals have been required to report to the state tumor registry, but the Oak Ridge hospital was the last to comply. She had heard of hundreds of thyroid cancers diagnosed and reported to the state Department of Health particularly in 1998 and 1999, but the I-131 report used the "last incidence data" from 1995. Those data after 1995 have been repeatedly requested, but never provided. Dr. Moore, the Tennessee State Epidemiologist, did not understand why she had not been provided with that information, albeit labeled "preliminary." He agreed to help her get it. However, he also pointed out that preliminary information is relatively worthless because of incomplete reporting and incomplete statistical analysis. He was currently analyzing state cancer sites through the end of 1996. The 1997 and '98 data are still too incomplete to be of any help to his studies.

Dr. Karl Markiewicz asked about the Tennessee gummed film network, which operated in Knoxville from 1956-57. *Did the releases from Oak Ridge affect that film, or was there a contribution on that film?* Dr. Hoffman answered that intuitively one would think so, but they did not measure radioactive iodine, but the non-volatile fallout. That was used in a mathematical model to calculate the iodine component. The Oak Ridge releases would not have affected the gummed film.

*Ms. Jeanne Gardener*, a former K-25 worker, advised ATSDR not only to do the surveys, but also to listen to the information of offsite residents. She noted the difficulty for an ill worker or a resident to have to wait all day for only two 15-minute public comment periods at this Subcommittee's meeting, and also asked if any sick workers or sick residents were members. Mr. Pereira responded that ATSDR has made strong attempts to have such representative persons. For many personal reasons, including financial issues and potential risk of their benefits, those people identified to date have chosen not to participate. ATSDR is again attempting to invite a sick worker's participation on the panel, which now has members who work or have worked at the facility. He encouraged applications from sick workers. Ms. Gardener reported that she herself is a good example of a person on disability who cannot receive any compensation for participating on a panel such as this. Knowing that, she wondered aloud why it was set up that way. Dr. Davidson noted that much of the Subcommittee's work is done through its workgroups, whose meetings are generally short (~1½-2 hours), and encouraged public participation.

Ms. Michell acknowledged ORHASP's hard work, but reminded the committee that DOE had publicly admitted that their records are flawed and inaccurate. Much of the I-131 report is based on that unreliable data. She also asked that the committee over time address other toxicants that of concern that are not included in the report. She charged that the EPA used this report and the long time period of nine years to avoid the human health hazard evaluation that is required by law for Superfund sites. EPA needs to fulfil its

obligations; this report does not take the place of a human health hazard evaluation. She noted that DOE this study and this Subcommittee. Dr. Davidson confirmed that other contaminants of concern will be addressed in future meetings.

Dr. Davidson read Mr. Napp's question to Dr. Peelle of *why the Oak Ridge signature contaminants of nickel, strontium, cesium, and chromium, which are in residents' bodies, were not included in the Phase I evaluation, and why was it not peer reviewed?* Dr. Peelle was not involved with ORHASP in Phase I. While he thought that some of those elements were reviewed, he recalled that some information could not be released during Phase I.

Mr. Napp: *Does the resignation of Dr. Lands from the Subcommittee opened a seat that could be filled by a sick self-identified resident?* Dr. Davidson said yes; that was to be considered on the following day by the Subcommittee.

Mr. Napp: *Dr. Hoffman's analysis of the ORHASP I-131 report task seems to contradict Dr. Grayson's report, in which at least one reviewer found no health effects in the Oak Ridge area.* Dr. Hoffman confirmed that. There are public health concerns, especially considering that the I-131 background was elevated over natural background, so he would not condone a lower bound set at zero. The ATSDR reviewers were also more restrained than he would be about the need for a public health response. But he noted that all four of them are health physicists, none are epidemiologists or chemical engineers; and the difficulty of doing such broad reviews.

### **Continuation of Subcommittee Discussion.**

Dr. Frome: *Was thyroid cancer an underlying cause of death in the autopsy data, if not the underlying cause of metastasis?* The under-ascertainment of thyroid cancer is unrelated to the causes of death on death certificates.

Dr. Brooks strongly took issue with the analysis related to the caustic scrubbers, found the design analysis of little value, and the assumptions improper. He cited the report's contradictions and lack of evidence for the scrubber, which for him called into question the legitimacy of the study results. He asked if Dr. Hoffman wished to totally review the assumptions of the caustic scrubber, which the latter confirmed. Dr. Brooks and Dr. Widner debated the report until Mr. Pereira suggested they resolve those questions privately.

Ms. Sonnenburg: *The Oak Ridge dose reconstruction summary notes that airborne releases from Y-12 were independently estimated at 5-7 times those reported by DOE. Where did that come from, and did you use the DOE statistics or did you multiply it by some other number?* Dr. Widner responded that the raw data from the stack sample measurements were used to independently calculate the releases. A lot of the depleted uranium was not tracked as carefully as the enriched ore, and some was not included in the official release totals, but the study did a more thorough

accounting. The study's estimates of uranium release of Y-12 and K-25 released were seven higher than DOE's, and they used those numbers. The efficiency of the scrubber treatment is definitely an important part of this.

Mr. Hill: *Please tell us more about the ability of workers to receive compensation.*

*Are the Veterans Administration and the Labor Department using the probability of causation in their adjudication of claims for all cancers?* Dr. Hoffman: Yes. A White

House Order now requires the use of the 99th percentile to ensure that the exposed individual gets the benefit of the doubt. So, if the extreme upper end is 50%, current legislation makes that ineligible for compensation and medical care. He personally disliked using the upper 99th percentile because it is too unstable, but there seems to be no room for discussion on this, and it goes into effect in July for workers only. Mr. Bill Murray, of ATSDR, reported that Mr. Larry Elliott of NIOSH could provide more details about this, and offered to provide his e-mail address for any questions. Ms. Michell advised the workers not to get their hopes up; they must have one of only a few cancers, and be able to prove that it was caused only by those few DOE facilities covered.

Mr. Hill: In view of the fact that the government persisted that there was no risk from radiation even as the experts proved there was, and the public's distrust results from that, he advised that it would be unwise to use that term in this setting.

Ms. Kaplan drew the members' attention to related material that she had developed and distributed, announcing that the second report had been briefly reviewed by Dr. Hoffman, but not yet by the Local Oversight Committee.

Mr. Akin: *Why are females and children aged 5 years more susceptible, and is that true for all cancers or only thyroid endpoints?* Dr. Hoffman: For all thyroid

endpoints, females have a higher background risk than males. The ability of radiation to induce an excess risk is well documented, but the actual underlying mechanism making the background risk for females and children higher than that for exposed males is unknown. While the endocrine systems of both sexes seem to be the same in childhood, something seems to happen later in life that changes that (i.e., precursive damage early in life to DNA that manifests itself later). But excess relative risk (excess relative to background), if mathematically normalized to background, shows little difference between males and females.

Mr. Lewis: *Since the past diagnosis of thyroid cancers may be underestimated, and cancer registries are of little help, is there enough present knowledge to extrapolate to what might have occurred in the past?* Dr. Hoffman: The uncertainty is present, but

is not infinite; some conclusions can be supported, and some not. Some of the report's elements such as the caustic scrubber, that may have been missed, can be re-evaluated. But disease registries did begin late, and the use of palpation rather than ultrasound to detect a thyroid nodule did lead to under-ascertainment. Even with ultrasound, a biopsy may be inconclusive, and some may have had surgery to be on the safe side. That is why mass screenings can be dangerous, potentially leading to many unnecessary surgeries due to false positive results. Some of the inconclusive studies in the past were so because they focused on incidence; only examination of

national data on thyroid cancer mortality produced a statistical relationship between fallout and thyroid cancer.

Dr. Davidson read a public comment by a UT professor into the record: *Why were only DOE-friendly people asked to review the I-121 study?* Dr. Davidson also asked *if there is information is available on the relative intake of I-131 and the uptake into the thyroid in children versus adults, and in girls versus boys, because differences and disease outcome can either be due to different amounts getting into the target tissue (the thyroid) or an inherent sensitivity in one or the other.* Dr. Hoffman reiterated that there is little difference between boys and girls in terms of either milk consumption or transfer from milk to blood, and blood to the thyroid. In the earliest months of life such as the neonatal period, the uptake from blood to the thyroid would be high (~60%) versus ~20% normally. The biggest difference between children and adults is that children drink more milk and have smaller thyroids, which produces a difference of 10-20 times in the dose to the thyroid. But while there is no difference in dose between males and females on the NCI Website, there is a difference in risk. Ms. Kaplan stated, as a person who had a false positive result and had the surgery, that having a surgery and living for any length of time with the terror that one might have cancer is not a trivial thing; it is really life-altering experience.

### **Closing Comments**

Dr. Davidson mentioned that the iodine issue would be addressed in the ORRHES Workgroup, and again invited any of the public wishing to become involved to attend the workgroup meetings. With no further comments, the meeting adjourned at 7:30 p.m.

### **JUNE 12, 2001**

On the following morning, the members reconvened at 8:30 a.m. Members present were:

Al Brooks	Jeff Hill	L.C. Manley
Bob Craig	Susan Kaplan	Therese McNally
Kowetha Davidson	Jerry Kuhaida	Donna Mosby
Bob Eklund	James Lewis	Bill Pardue
Ed Frome	David Johnson	Barbara Sonnenburg
Karen Galloway	Peter Malmquist	Charles Washington

Mr. Don Creasia was absent.

All the liaisons were present: Elmer Akin, Chudi Nwanga, Brenda Vowell; as was LaFreta Dalton, Executive Secretary.

ATSDR staff present were: Sherri Berger, Bill Carter, Carl Markevitz, Theresa Nesmith, Lucy Peipins

Members of the public or presenters attending included::

Ann Henry

Cathy Nye

Janice Stokes

### **Opening Comments**

Dr. Davidson again thanked DOE for arranging and summarized the previous day's tour of the ORNL X-10 facility.

### **Presentation of the ATSDR Epidemiology Workshop**

Ms. Sherri Berger and Dr. Lucy Peipins, of ATSDR's Division of Health Studies, provided an overview of the science of epidemiology. They also provided a copy of the study by Joseph Mangano of "Cancer Mortality Near Oak Ridge, TN." They defined epidemiology as the study of the distribution (who, what, when, where) and determinants (why, then) of disease in populations. It involves groups of people, not individuals; measurement; and comparison.

In groups of people, *epidemiology can* determine the impact of disease and detect changes the occurrence of disease; it can measure the relationship between exposure and disease; and it can evaluate the efficacy of health interventions and treatments.

*Epidemiology cannot* determine the cause of an individual's disease, with a few exceptions; it cannot prove a particular exposure caused an illness, and it should not be conducted without good measurement of exposure and disease.

Epidemiology can draw some information on exposures and outcomes from evidence already compiled in animal studies, case reports, or toxicological models. The common steps in establishing a relationship between exposure and disease are: report of a series of cases (e.g., by a physician); descriptive analyses to describe the problem, those affected, and where the disease is occurring; analytic studies to test the exposure-disease hypothesis in a study group; experimental reproduction of the disease by exposure in animals; and observations done to assess whether removing exposure lowers disease.

*Statistics/Measures of Disease Frequency.* Disease frequency can simply be measured by counting the affected individuals, Ms. Berger began, but that is not enough. The significance of three cases of a disease occurring in a town of 1000 people is much greater than the same number in a city of 100,000. Epidemiology, therefore, examines at the size of the population from which affected individuals come and the time period in which the information was collected.

A *rate* is a basic epidemiologic measure that is used to compare the frequency at which disease occurs on a group and to compare that occurrence to other groups. It is calculated by dividing the number of events in a specific time period by the average population over that period. A *mortality rate* is the number of deaths in a defined group

during a specified time period; a *birth rate* does the same for births. *Incidence* is another type of rate. It is arrived at by dividing the number of new cases that develop in a period of time by the number of individuals at risk during that time period. For example, 150,000 new cases of lung cancer in the U.S. in 1997 would be divided by the population present at that time (150,000 ÷ 260 million). The result, 0.000058, would then be multiplied by 100,000 to determine the rate: 58 cases per 100,000 people per year.

*Association* measures how much greater the frequency of disease may be in one group than another. It is often provided in a two-by-two table, demonstrated by Ms. Berger as an example. Into the four squares, for example, all the participants in a study of lung cancer and smokers/non-smokers can be categorized/placed (smoking: yes/no; lung cancer: yes/no):

	lung cancer: yes	lung cancer: no
smoking: yes	a	b
smoking: no	c	d

*Relative risk* (RR) can then be measured. It is the likelihood that one group (e.g., the exposed group of smokers) will develop a disease compared to the unexposed group. Relative risk is calculated by dividing the incidence in the exposed group ( $a/[a+b]$ ) by the incidence in the unexposed group ( $c/[c+d]$ ). If the result of the calculation comes out to 1.0, there is no association between exposure and disease and the risk is even whether one is exposed or not. If the result is above 1.0, there is a positive association or an increased (excess) risk (e.g., a 2.0 RR indicates twice the risk of someone unexposed); if it below 1.0, there is a decreased risk among the exposed group.

*Standardized Mortality Ratios* (SMR) are the ratio of an observed number of deaths to an expected number of deaths. The expected number is drawn from a standard group (e.g., U.S. the population or a county), which is similar to the exposed group of interest. The standard group serves as a comparison group. The number of deaths of the exposed group are divided by the observed deaths of the comparison group to arrive at an SMR. So, for example, if 58 deaths are found in an exposed group, and the comparison group has 42.9 deaths, the SMR ( $58/42.9$ ) is 1.35: the exposed group has a 35% higher risk of death.

*Measuring Exposure and Outcomes in Environmental Epidemiology.* An outcome is *any* change in health status or body function, which covers a broad range (e.g., from wheezing to disease and death). Outcomes can be local or systemic, acute or chronic, and reversible or irreversible.

Dr. Peipins commented that measurement of both exposure and outcomes must be clear to produce a definitive study result. The measurement, therefore, has to be precise. Exposure by contaminants can produce an outcome at the point of entry and/or one that is distributed throughout the body (“body burden”). The exposures can be measured in a

number of ways. The best is from direct biological analysis of body tissue; the poorest is measurement of such surrogate measures as environmental samples of the general area in which a person lives.

Biologically plausible outcomes are explored by ATSDR, by contaminant route of exposure (to define the vulnerable organ systems), toxicity or level (severity of outcome), and potential alternative explanations for an outcome (confounding factors). But importantly, health effects are not uniquely caused by environmental exposures. For example, 1 in 2 men will develop cancer, and 1 in 3 women will do so; 2% of infants are born with developmental disabilities; 25% of pregnancies result in spontaneous abortions; and 8-10% of children have asthma.

Cancer is a particular problem as an outcome because of its complexity. For example, smoking causes most of the cancer in the U.S., and 25% of Americans smoke. Cancers can take a long time to develop after an exposure, and many other exposures may occur in the interim. In addition, cancer is not one, but probably more than 100, different diseases that affect 40 anatomic sites.

In *measuring adverse health* effects, the goal is to count all the cases in an exposed group or population and to compare that with cases in an unexposed group. The sources of this information include death and birth certificates, medical exams, hospital discharge data, questionnaires, disease registries, and lab tests or biomarkers of exposure. But all these sources are very variable in their ability to report the severity of the disease; the accuracy of the disease classification; information on such potentially contributing confounders as smoking; and finally, they vary in cost, complexity of access, and invasiveness.

Dr. Peipins outlined some of the shortcomings of these sources:

- Death certificates: do not list all conditions of interest, only those that cause death; have considerable inaccuracy in diagnosis; and have no data on other risk factors.
- Registries: are relatively new. They exist for reportable disease (TB, cancer, birth defects), but only cancer incidence data are available for all states. They do not collect data on other risk factors, and the completeness/timeliness of their data may be an issue.
- Medical exams/biologic tests: are the “gold standard,” but diagnosis may vary for outcomes with no standard case definition (e.g., asthma, multiple sclerosis).
- Questionnaires: may miss most severe outcomes. They involved self-reports of illness or symptoms; the wording/type of administration may influence responses; and they are subject to recall and response bias. However, some outcomes may be measured only through questionnaire, and they enable collection of data on other risk factors.

Other considerations include the timing and latency of reports (especially important in chronic disease), individual variability (e.g., by age, gender, pre-existing illnesses, and

genetic predisposition); and confounding and bias (alternative explanations for an exposure-disease association).

In summary, the basic criteria for considering a health study are:

- Necessary: measurable exposure, completed pathway to an exposed population, and a measurable effect that is plausibly related to the exposure.
- Will the epidemiologic study advance knowledge about the relationship between exposure and disease?
- Judging a cause-effect relationship: strength of association (relative risk: the larger the risk, the more likely the relationship exists); consistency of this study's findings with other studies, study designs, and groups of people.
- Judging the dose-response relationship: whether disease increases with exposure, based on the exposure which must occur first, and biologic plausibility (there is a known mechanism for the exposure to lead to disease).

*Discussion* with Dr. Peipins included:

- Ms. Sonnenburg: *Would you track people who may have been exposed? If the basic criteria are fulfilled. I keep hearing that epidemiology studies (e.g., Chernobyl and Hanford) could neither prove nor disprove a relationship between I-31 exposure to the thyroid and thyroid disease. If you have 1000 children with thyroid disease in one area and only 6 in another, or, if more tests show them to be ten times over the normal rate, would that prove the association? How high does the ratio have to be before you determine there is a relationship? I have not read the Hanford study. (Please do by September.) But I would say that there is a relationship; such a large relative risk (i.e., 1000:6 versus 50:48) certainly strengthens the case, if not definitively proves it. There is no standard level of an effect for a relative risk. It is dependent on other factors such as confounders. What is your opinion of the Mangano study distributed? I would not say it was good or bad. It was just provided so that at the next workshop in September these principles of epidemiology study can be applied and to see how it stands up to critical analysis. But one might note that it is a study done at the county level.*
- Mr. Lewis: *What is the impact on such studies of people concerned about privacy issues (e.g., potentially raised insurance rates)? Study Institutional Review Boards (IRBs) try to ensure confidentiality, and information leaks are rare, but those concerns do reduce the ability to do these studies. What should we tell the public about the validity of anecdotal, verbally reported, data from the community? We cannot answer about legalities; but such observations are not surprising, given how many people naturally develop cancer.*
- Ms. Kaplan: *How specific is the data on cancer incidence collected by registries? Are interviews done? It varies by state; some will analyze by county/zip code, but no personal interviews are done.*
- Mr. Pardue: *Why use mail questionnaires, with their poor rate of return and potential*

*bias?* They can help to discover what other factors may contribute, but in-person interview is much better. *Why not do more clinical studies than epidemiology?* That can be the community's choice, but the epidemiology study could add to the knowledge that would indicate/support a clinical study.

- Mr. Kuhaida: *How do you factor in the frequency and magnitude of exposure (e.g., three very high exposures versus long low-dose exposures)?* The importance of such factors often depends on the contaminant. Categories are assigned for analysis (e.g., low frequency and high exposure, or vice versa), and the results are compared to current knowledge that can be helpful (e.g., toxicology, medicine).
- Dr. Brooks: *What are the effects of sample size on study validity?* This can be further explained in another workshop, but "spikes" of disease that naturally occur can be seen in small cohorts. These can be leveled out with a large enough cohort to indicate the true underlying incidence, and to determine how many cases are required to satisfy statistical significance about the exposure-disease relationship.
- Dr. Frome: *Standard error is another statistical tool used to judge how far a relative risk is from a standard point.* It can factor in exposure and non-exposure to indicate the significance of whatever relative risk is calculated.
- Mr. Johnson: *How do you address roadblocks to research, such as inaccessible data?* Part of the considerations of the study design is to ensure that all the necessary data will be accessible.
- Dr. Davidson: *How do confounders affect interpretation of an epidemiological study?* A stratified analysis can be done to address confounders. For example, data for those who were exposed to radon and developed lung cancer can be delineated by those who smoked tobacco and those who did not.

### **Public Health Assessment Process**

Mr. Jack Hanley reviewed the steps of the Oak Ridge public health assessment process, and the independent review done for ATSDR of the Tennessee Department of Health's screening evaluation in the Oak Ridge health studies. The public health process is to identify for the area residents any exposures from the site, and to evaluate any risk from those exposures. They will then report on any contaminant levels of concern found to the public and to relevant local, state, and federal agencies, and advise on potential follow-up public health actions.

Mr. Hanley reviewed the steps in this process: 1) evaluation of all the site information gathered over the years, 2) identification of community health concerns, 3) identification of any contaminants of concern, 4) determination/evaluation of a pathway of exposure, 5) assessment of public health implications of exposure, and 6) report on the conclusions and recommendations, including 7) a site-specific action plan.

Steps 1 and 3 were initiated at the March ORRHES meeting. Step 1 involved review of the Tennessee Department of Health's environmental dose reconstruction of past releases

from the ORNL and those contaminants of largest impact offsite. This report recommended further evaluation of iodine 131, mercury, cesium 137, polychlorinated biphenyls (PCBs), uranium, and fluorine and various fluorides.

In its Task 7 Screening Evaluation, the Oak Ridge Health Agreement Steering Panel (ORHASP) did an additional screening of 18 other contaminants based on the quantities onsite and on expressed public concern. Three different approaches were used:

Qualitative evaluation: screening for contaminants used in quantity, in certain forms and in manners of use, that could have gone offsite. Those going offsite below levels of concern were screened out (e.g., in too-small quantities; the forms of carbon fiber and glass; and those used in sealed cylinders).

Quantitative evaluation was done of the three materials for which there had been insufficient information previously. If found to be below threshold quality limits with the conservative screening index used, these were screened out. The quantitative analysis screening was done in two levels:

- \* Level I: The conservative screening level indices used by the ORHASP were similar to those used by EPA, regulatory, and health agencies. Estimates of maximum exposure dose from the ORNL materials (worst-case exposure) were done. If these were below the decision guidelines, no further study was done.
- \* Level II: If the levels were above the screening guidelines, further evaluation was done using less conservative, more realistic screening parameters for exposure levels and environmental concentrations (e.g., soil ingestion such as through eaten fish, or dirt eaten by children; air; time in spent in an exposure location, etc.). However, these remained considerably conservative because the same transfer factors and toxicity values were used.

As before, a screening index below decision levels were dropped; those above received high priority for further study. That study ultimately resulted in designation of arsenic at K-25 and arsenic and lead at Y-12 as high-priority candidates for further study. The screening process of Level II was outlined on a distributed chart (Attachment #1, Table 2). Mr. Hanley noted that beryllium was screened out for offsite risk of chronic beryllium disease and for cancer endpoints, using the most conservative, worst-case scenarios.

*Discussion* included the following:

Ms. Sonnenburg/Kaplan: *Were any of these compounds screened out because there wasn't enough data?* Yes. In the absence of data for some facilities (e.g., the three contaminants at Y-12), estimates had to be made.

Mr. Manley: *What are the toxic effects of rare earth metals? I handled two of them.* Mr. Hanley agreed to check the toxicological information on the cited compounds, which are considered rare earth materials and are likely to have little information on them.

Mr. Lewis: *What will be done about contaminants of high priority such as arsenic that were screened out for low levels but may have had higher cumulative levels*

(e.g., including TVA and other plants)? ATSDR's mandate is only to address ORNL; it has no authority to address others. But if other obvious public health issues seem to arise, they will be referred to the appropriate agencies. *But you are factoring in contaminants from the NTS tests, and comparatively, these are right next door.* Mr. Akin: that is a question of total risk, not the risk specific to ORNL that is being pursued here. Mr. Hanley: we can investigate what data are available to indicate total risk, but our authority does not extend to doing detailed analyses of sites other than the ORR.

Mr. Hill: *Why was X-10 not shown as an arsenic source; it burned coal for a very long period?* ATSDR agreed to investigate this.

Dr. Eklund: *What is the value of doing this work if all sources are not considered to indicate the true risk? Reporting only on ORNL could mislead people. Our final report should include a strong recommendation to look for all the sources of contaminants. There are residents of Roane or Anderson counties who never worked at ORNL and have toxic levels of arsenic in their body.* ATSDR will reanalyze some of the older analyses using the more updated EPA maximum concentration transfer factors (as opposed to the NCRP transfer factors previously used), and they will do a separate analysis of current exposures. These screening analyses can help to further establish the ORNL emission levels, which would be of interest if a comprehensive, additive analysis of risk is done. ATSDR also can extrapolate potential contaminant spread, for example, from levels found in soil data combined with wind direction/pattern data, to determine whether some of the contaminants found could have come from another source. Doing detailed modeling from TVA or other sources is not within ATSDR's purview; but regardless of the source, if a public health hazard is determined (e.g., high levels of arsenic or in the water source or PCBs in fish), ATSDR will recommend a responsive public health action. In one case, a community was advised to use alternate water sources until more detailed analysis could be done of the local sources. But implementing such an action is the domain of the local or state agencies.

Several members of the committee expressed frustration at the division of agency responsibilities that seems to prevent the kind of overall health evaluation desired. But aside from that important goal, this also involves a national debate about litigation and the culpable party. If DOE is not the sole source of the contamination, it should not take all the blame.

Dr. Frome: *Could the homes' coal burning also have been a significant source of contaminants?* That is possible, but ATSDR does not know.

The Tennessee Department of Health reports were released publicly in January 2000, and a panel of independent experts conducted a technical review of them at ATSDR's request. They evaluated the quality and completeness of the report to indicate if it could provide a foundation for public health decisions. They found that some of the report's screening level methodologies were internally inconsistent (e.g., using maximum numbers for arsenic

under surface water of Poplar Creek, but mean values for the Y-12's McCoy Branch; or were inconsistent in the conservatism of their concentration factors).

Every study has strengths, weaknesses, and limitations which must be considered to properly interpret its findings. While the reviewers found the reports' interpretations to be reasonable, appropriate, and well supported, they disagreed that this type of screening index should be used to only identify the contaminants posing a low health risk. It is good for identifying pathways of exposure. It should not be used to determine relative risk or to identify the important exposure pathways.

One thing noted by the reviewers was the ingestion of contaminated vegetables and fish as primary pathways of concern (80-90% of dose). However, that may have been due to the conservative screening, transfer, and bioconcentration factors. Overall, the reviewers found the report's conclusions to be reasonable, and the approaches to be well supported and appropriate for making public health decisions. ATSDR is following up on the study's weaknesses in its own screening analysis for the contaminants of concern.

### **Presentation of ATSDR Screening Process**

*Dr. Karl Markiewicz* provided an overview of the three steps of the screening process, which are to determine if:

1. The chemical concentrations are above acceptable screening levels: Determine the important compounds and chemicals, using maximum concentrations in air, soil, water, and biota, particularly in cases of incomplete or missing data.
2. The chemical concentrations are above screening levels in areas of exposure. In the case of missing or incomplete data, ATSDR will assume the maximum bioconcentration of any adjacent areas known to risk exposures.
3. The calculated exposure doses exceed health values for each chemical in each area.

*Dr. Markiewicz* described the screening calculation, which is  $EMEG = MRL \times BW / IR$ , where EMEG is Environmental Media Evaluation Guide (for water and soil); MRL is Minimal Risk Level (measured by mg/kg/day; ATSDR's standard established levels are similar to the EPA's reference doses, with safety factors added on); BW is Body Weight (kg); and IR is Ingestion Rate (units/day). This process is very health-protective; it is simply the MRL times the body weight, without considering bioavailability, cooking loss, chemical form of the process, etc. Those factors are considered later in the process that considers the public health implications.

*Discussion* included:

*Ms. Kaplan: Worker studies are often not based on actual health impact, but rather on the limits of measurement. What are ATSDR's? You need to be very clear for the public that some of these conclusions are based not on research, but on equipment limitations. ATSDR uses all available data, animal (e.g., the PCB MRL*

is derived from rat studies) or human, and for some compounds will use a biokinetic uptake model. The report will be clear, for example, if doses are greater or lower than the literature's values, and try to interpret the meaning of that, to provide some perspective.

Ms. Sonnenburg: *Where/how do your equations consider cumulative lifetime dose? That is included in the more refined analytic process. How can you distinguish present dose from those in the past? E.g., the TVA emissions data are available for the last few years; but not for the past when the air cleaning equipment was absent or inferior.* Some of these elements linger in the environment and can be sampled; or, if the process' material usage is known, the emission can be extrapolated by dispersion models.

Mr. Akin: *From where does the ingestion rate data come?* The data for the first screening analysis is historical (e.g., site, state, and dose reconstruction data such as on fish ingestion to calculate PCB exposure). That for the second screening analysis of more recent exposures will use data of offsite sampling around the reservation. The offsite actual value used for the calculation are ATSDR's or EPA's. Whether past or recent data, they will be presented with their limitations. And if, for example, as has commented occurred with mercury levels, if past data seems to have been under- or overestimated, ATSDR will try to determine that and any effect on the reported outcomes.

Ms. Kaplan: *Data indicate that mercury-contaminated soil from the East Fork of Poplar Creek grew huge quantities of vegetables, but the mercury risk levels (measured for dehydrated foods) indicate that a lot can be eaten without harm. But are there any other contaminants of concern in soil-grown food?* Arsenic was identified as another such element, but the more recent EPA biotransfer factors were reduced, so those levels of concern may also be lowered. The biota analysis will break down all the foodstuffs addressed in the analysis.

Mr. Lewis: *Was any analysis done of the game living on the reservation?* Yes, some was screened in the annual DOE monitoring reports; and some ecological studies done for the Superfund cleanup work will include such data. At some sites, both turtle and racoon data were analyzed.

Dr. Davidson: *Are the EMEG parameters for children or only adults?* Adults; but if there is a particular concern for children, we have carried that through in the analysis. This is generally done for lead, for example, to which children are particularly sensitive.

## **Public Comment**

Ms. Janice Stokes reported her own contamination with multiple heavy metals, and pleaded for a clinic to study and treat the effects of such contamination. Her body burden includes nickel, now at toxic levels in her body, for which she has received chelation therapy. It may have come from the K-25 barrier pipes. Although she did not work at the plant, she has measurable and elevated levels of copper, barium, arsenic, chromium, lead,

mercury, cesium, nickel and uranium body burdens. She called for someone to be seated on the ORRHES who is, like her, a local resident familiar with the data and who has these contaminants in their body, to provide a balanced input to those who disbelieve there have been any effects. Secondly, she opposed spending several million dollars on an epidemiologic study, when it could fund a multidisciplinary clinic for the residents to detect and treat heavy metal contamination. Oak Ridge offers the scientific facilities and intellectual power to be a model pilot project. She implored the Subcommittee to support a health clinic to address those who are feel that they have been most affected.

She noted that since the contamination from fish ingestion will not necessarily be measurable in the blood stream at high levels at all times, a challenge test is needed to detect it. This was not used by ATSDR and is not normally used in a standard physician's office visit test. She noted that the ATSDR study results are countered by other studies, and charged that communities in the southeast whose problems were addressed by ATSDR were not helped. She stated that ATSDR was chartered to, and is mandated by FACA-chartered boards to, set up health intervention clinics. However, this was changed by Congress 7-8 years earlier, and can be changed back. She believed that ATSDR can locate a clinic in Oak Ridge if the Subcommittee recommends it, which she urged them to do. She hoped that nickel would be studied as a contaminant of concern, and she called for an end to "paralysis by analysis."

*Mr. Dwight Napp* asked if the additive or synergistic effects of contamination could be addressed for levels of health concern. There is some information on synergistic effects, such as the combination of cigarette smoking and asbestos exposure, but in general the literature has little evidence to offer on synergistic effects. ATSDR examines what is known. There are multiple chemical effects studies from the Netherlands indicating no synergistic effects at lower levels than are typically present in the environment. Mr. Napp commented that a clinic could help to compile that knowledge. He asked the Tennessee Department of Health if there is a mechanism to track such sub-clinical effects of noncancerous conditions as hypo- and hyperthyroid disease, which Dr. Hoffman had indicated on the previous day could be an impact of exposure. Ms. Vowell knew of no such mechanism.

*Dr. Frome* read an e-mail letter to the Environmental Quality Advisory Board from a person identified as Michael Stevens, which was distributed to the Subcommittee members. Mr. Stevens expressed concerns about the environmental safety of Oak Ridge, as he is planning to move there. Ms. Ellen Smith, of EQAB, an Oak Ridge resident and an environmental scientist at ORNL, referred him to Websites which could provide other information, and expressed her own opinion as a 20-year resident that the environment is a safe place for her and her family. She thought there to be no immediate threats to public health from the ORR, "unless surveillance and maintenance lapses occur and cleanup fails to occur." Dr. Frome invited ATSDR and members of the board so inclined to also respond to Mr. Stevens.

Ms. Stokes responded that there is the potential of mercury vapor, which occurs at 72 . It rises from East Fork of Poplar Creek when it is low in the summer, and which is recontaminated by the incinerator every time it floods. She was concerned that houses are being built nearby whose buyers are unaware that they risk contamination.

With no further comment, the Subcommittee adjourned for lunch, after which Mr. Hanley completed his presentation.

### **Presentation of the ATSDR Program of Work**

Mr. Hanley presented ATSDR's draft program of work (Attachment #2), showing the Subcommittee's opportunity to comment on a) the information available, b) ATSDR's assessment, and c) ATSDR's report. This process began with iodine, and will continue for mercury, PCBs, and all the past contaminants identified in the screening process. All the reports will be compiled into a public health assessment document for public comment, which will be addressed in the final PHA report.

#### *Discussion included:*

Mr. Lewis: *Is there a point in the process to evaluate the conflicting studies referenced earlier?* ATSDR will examine what is brought to it; if appropriate, it will be brought to the Subcommittee as well. This was done by Dr. Hoffman on the previous day, or comments on fluoride that were provided, leading to it being added to ATSDR's list of contaminants of concern that will be addressed and presented later in this process. ATSDR much prefers to gather this input early, rather than waiting until after the analyses are done, but the process is deliberately long to allow as much of that input as possible.

Mr. Pardue: *Can we advertise a solicitation for such information to make sure it is not brought up at the last minute?* ATSDR developed a compendium of all the activities that have been conducted relative to the ORR, and had received little to add to it. Perhaps the Communication Workgroup could suggest other methods to solicit such input. Mr. Lewis suggested letters to other organizations in the area.

Mr. Akin suggested developing a cross-referential document about the role of epidemiology and the public health assessment, relative to drawing conclusions about health hazards in a community as pertain to specific chemicals and their sources. Perhaps Ms. Berger and Dr. Peipins can explain those differences at the next meeting. The Communication Workgroup also is working with Ms. Dalton to develop the health assessment and needs assessment processes.

Ms. Kaplan: *What do you do with additional information once you receive it? For example, CDC responded to the document "Inconclusive By Design", but no discussion ensued.* That is up to the Communications Workgroup and the Subcommittee; outstanding issues can be discussed, but these were not raised.

Dr. Frome: *How far along, for iodine, is ATSDR to do Step 4, evaluating public health effects? That first-cut report could one place where people could identify*

*work not reviewed or discussed by ATSDR.* Agreed; if such issues are raised by the Workgroups, ATSDR can return to the Subcommittee to discuss that. If there are none, work will begin on mercury. Dr. Brooks reported that the Step 4 discussion of iodine is scheduled for the September meeting.

Dr. Eklund agreed with Ms. Kaplan that a formal mechanism is needed for information, such as "Inconsistent By Design," that is not applicable to the source term or contaminant information but might offer good critical input. He suggested a Workgroup evaluation of such matters and then a report to the Subcommittee on it, perhaps under "New Business." Dr. Davidson asked the Workgroup advise how they would like to handle this.

Dr. Brooks thought that a special meeting would be required to be able to forward that in September, since the formal process has the Workgroup reporting to the Subcommittee, which then reports to ATSDR. However, Ms. Kaplan noted that this was the discussion through which the Subcommittee would refer this to ATSDR, so a precedent had been set in doing that. Dr. Davidson asked the Procedures Workgroup to review these steps at their next meeting to go see if any adjustments are needed.

## **Workgroup Reports**

### ***Agenda Workgroup (Attachment #3)***

Dr. Brooks reported two meetings of the Agenda Workgroup and their adoption of this meeting's agenda. They prepared and soon will finalize with Ms. Dalton a preparation schedule for the September meeting. Another two meeting dates will be held to plan that agenda. The Workgroup also considered the Program of Work (dated 5/5/01) which was presented at the last meeting. A corresponding milestone chart was created and will be updated with work progress. Dr. Brooks **moved that the ATSDR Program of Work for the public health assessment be adopted as a living document expressing the future tentative plans and schedule of the task.** The motion was seconded.

Mr. Lewis had no objection as long as it was clear that this is a living document for which review and comment had just been requested. Ms. Kaplan stated that the program of work was never discussed by the full Subcommittee, only by the Workgroup. Dr. Davidson distinguished this document from another developed by Dr. Brooks which had a time line incorporated to it. Since this document simply reflects the steps in the process with no specific time line, a formal adoption may not be necessary.

Dr. Brooks rejoined that the Workgroup would just proceed to work with ATSDR to accomplish agendas and schedules. He explained that this was simply an update on a few minor changes to the Program of Work that was developed with the Workgroup. It was adopted by the Subcommittee as a living document at the last meeting. Since Mr. Hanley had elaborated on the original sketchy plan, he now felt that the plans should be merged and finalized. The information at this meeting now allows a similar brief work program with a milestone chart to be developed for the health needs assessment. Pending ATSDR's

and GWU/Hahnemanns agreement that it is representative of their intended work, the Workgroup can produce a final document.

Dr. Davidson suggested referring this back to the Public Health Assessment Workgroup to decide if the flow chart includes all the steps necessary, as previously requested. Dr. Brooks **withdrew the motion**. Dr. Davidson clarified that the presentation on this day by Mr. Hanley was more of a logistical procedure than the 6-step program of work which was presented to the Subcommittee and incorporated into the ORRHES press release describing the March meeting. Dr. Brooks agreed; the other document supplied a lot more detail about these steps, including references to data. The milestone chart simply compiled the time indications of Mr. Hanley's other document onto one sheet of paper, to help prevent the scheduling of too many topics for one meeting (as has occurred already). Ms. Dalton assured the Subcommittee that the document provided merely process information, and was a shorter complement updating the more detailed previous program of work document. They are complementary rather than stand-alone pieces.

Dr. Brooks **moved that the Subcommittee request from ATSDR and GWU/Hahneman the brief information necessary to form a program of work and a milestone chart for the public health needs project, similar in content to those of the public health assessment project**, a brief description of the tasks, and when they hope to complete them (including presentation dates). Dr. Davidson noted that this was already an action item for ATSDR to present that program of work based on Mr. Christenson's presentation of the previous day. Upon a **vote**, 14 were in favor, and none opposed. The **motion carried**.

### ***Public Health Assessment Workgroup (PHAWG)***

Mr. Pardue reported two meetings held by this, the Subcommittee's newest workgroup.

On May 7, 2001, the items discussed were:

- General discussion of scope and function.

- Start development of the PHAWG scope and mission statement.

- Discuss draft outline for "Epidemiology 101" presentation by telephone with Lucy Peipins.

- Receive dry run briefing from Jack Hanley on development of the public health assessment.

- Review tentative agenda for addressing the entire iodine-131 issue.

One May 31, 2001, the Workgroup:

- Reviewed, discussed, and commented on the presentation on epidemiology by Lucy Peipins to be given at the June 12 meeting.

- Received an updated presentation by Jack Hanley on the PHA process.

In addition, Mr. Pardue commented that the agendas for the Workgroup meetings have been too crowded with presentations, precluding the ability to address anything in detail.

He requested ideas for the next Workgroup meeting, which he also suggested be scheduled for 3-4 hours rather than two.

*Discussion* included Ms. Sonnenburg's question of whether the *members of the public can just provide a phone number, address or e-mail to be advised of the Workgroup meetings?* The answer was yes; they can be provided to Mr. Pardue (or to Dr. Davidson, for any workgroup). The e-mail addresses are also on the committee roster. Ms. Stokes requested to be on this Workgroup.

### **Guidelines and Procedures Workgroup**

Dr. Davidson reported that the Guidelines and Procedures Workgroup had one meeting since March. They were asked to address the following:

- I. Define the vote to recommend on what constitutes a major recommendation to ATSDR, for which the bylaws require a two-thirds vote. The Workgroup included:
  - A. Advice or recommendations to ATSDR regarding the public health assessment, the health education needs assessment, or public health follow-up activities.
  - B. Advice or recommendations that affect the makeup or structure of the Subcommittee, including recommendations concerning the liaison members on the Subcommittee.
  - C. Other recommendations as determined by a majority vote of the Subcommittee. That is, if there is a difference in opinion of what the major recommendation is, a majority vote decides if this is a major recommendation (which in turn requires a two-thirds vote).

Ms. Sonnenburg **moved to accept the Guidelines and Procedures Workgroup's report on major recommendations.** The motion was seconded and carried with 15 in favor and none opposed.

- II. Procedure for individual Subcommittee members submitting material to ATSDR for distribution to the Subcommittee.
  - A. Material submitted to ATSDR for distribution to the Subcommittee members must be received by ATSDR 4 weeks before the next meeting. The material must include a cover letter describing: (1) what is being submitted, including a brief abstract or summary of the material, (2) why the individual wants the material distributed to the members, and (3) how the material is related to the activities of the ORRHES.

**A motion was made and seconded to accept the Workgroup's recommendation.** Dr. Davidson explained the multitude of tasks that ATSDR staff must accomplish to convene a meeting. Members of the public who wish to bring something to the Subcommittee's attention at the meeting are welcome to do so, as long as they bring their own copies. Dr. Davidson called the question. With 14 in favor and one opposed, **the motion carried.**

### ***Health Needs Assessment Workgroup***

Mr. Lewis reported on a brief meeting held on the previous day with Greg Christenson, Teresa Nesmith and Bill Carter. They discussed some of the issues of the health needs assessment and opened up links of communication to help the work proceed better.

### ***Communications and Outreach Subcommittee Workgroup***

Ms. Kaplan noted that quite a bit of material from her had been distributed at various times, including a June 11 report about two Workgroup meetings which addressed three major categories:

1. Tools to improve the Subcommittee/public communications are on the Web page: a community input form, an Oak Ridge fact sheet, and discussion of putting the Subcommittee and workgroup meetings on the Oak Ridge community calendar.
2. Refining the communications and outreach strategy: a procedure was added for a pre-meeting press release, which was submitted to Ms. Dalton.
3. A list of general recommendations to ATSDR was compiled (Attachment #4a), some of which they have already implemented. Further suggestions will be welcome.
4. A training recommendation to ATSDR was developed.
5. The minutes from the May 21 meeting was sent to the members. She requested a motion at the next Workgroup meeting to approve those, having received no comments on them.
6. A communication and outreach strategy was voted on by the Workgroup and provided to the Subcommittee on the previous day (Attachment #4b). She suggested that the word "Draft" be removed from that if the Subcommittee votes to accept it at this meeting. The only changes from the March meeting were under item #3, is now "Procedure," and still to be changed under #7 was "MP" to "Ms. Dalton."

A motion was made and seconded to **accept the proposed Communications and Outreach Strategy**. The vote was 14 in favor and none opposed. The **motion passed**.

A motion to **accept the proposed list of recommendations to ATSDR** was seconded. With 13 in favor and none opposed, **the recommendations passed**.

Ms. Kaplan referred the members to their meeting book's Tab 6, which contained a Workgroup resolution on the Subcommittee Web page which the Workgroup endorsed. Dr. Frome noted that page one was the resolution; the second and third pages were informational about the Website contents (e.g., regarding HTML links and PDF files).

*Discussion* included the following:

Mr. Hill: *Who will maintain the Web site?* That will be determined by the ATSDR Web Administrator; it could be maintained in-house or by a contractor.

Dr. Frome: *How do we decide which information should be put onto the Web site?* Documents such as the program of work that ATSDR has already approved internally would automatically be placed there. There is an ATSDR Website committee that

reviews all potential documents to go on the site. If there are any portions of the Website resolution with which ATSDR cannot comply, the Subcommittee will be advised. *Will all the information on the Website be publicly available? The Hanford site requires a password.* The Hanford site is not yet a public document on the ATSDR server. Once that is done, no password is needed.

**Presentation of the ORRHES Website.**

Ms. Dalton reported the content approved for placement on the Web site:

1. The Community Health Concerns Comment Sheet: was drafted in response to the members' wish to collect information from community members about their health concerns about the ORR site. The front of the sheet has prompts about the type of information the Subcommittee is looking for, the purpose of this, and contact information. An additional sheet can be attached. She requested comments on this draft. When final, it will be placed in the ATSDR Oak Ridge field office. The community concerns will be used in the public health assessment process. They generally are rewritten into specific questions and then answered in the final report.
2. The Oak Ridge Reservation Health Effects Fact Sheet: provides an overview of ATSDR's activities, CDC's two activities in Oak Ridge, and the Subcommittee's work, as well as contact information. It discusses the public health assessment and the health education needs assessment, and provides some background information about both. She requested feedback on this draft, which she developed with the Outreach Workgroup. When final it also will be placed in the ATSDR Oak Ridge field office.
3. A summary of the March meeting (the same document as the press release).

*Discussion* included:

Dr. Frome: *What will you do with all the health concerns? Will they be compiled in a database?* Ms. Dalton stated that they are retained as part of the record, but the format and contents of the database have not yet been determined.

Mr. Akin: *Can this be broadened to include a request for information that may relate to additional contaminants, pathways, or reports not addressed by ATSDR to date?* All that information could be included; it all is considered part of the public health assessment process. Mr. Lewis noted that this could be captured under item #2.

Mr. Hill: *How do you get back to the question's originator?* ATSDR does not typically do that unless they specifically ask to be contacted. Normally there is a statement, which will be incorporated into this form, that this information will be used as part of the public health and information that becomes part of the public record.

Mr. Lewis: *Can these comments be anonymous?* Yes.

Mr. Johnson suggested including a few paragraphs of the many uses of this information and a short caption to invite the persons' anonymous or attributed comment.

*Team Building Training Needs Assessment.* Ms. Dalton reported that a training was

provided to the Communications and Outreach Workgroup meeting on May 8 about several issues: trust building, communication, Subcommittee mission, goals, etc. The Workgroup compiled specific recommendations about the workshop such that it must be at least a day long. It will be provided at a full subcommittee meeting, on the proposed date of July 31. It is a team-building, conflict resolution, consensus-building workshop to be at the Children's Defense Fund lodge in Clinton, from 9:00 a.m. to 6:00 p.m. Information will be provided about the facilitator, who will return on September for a one-hour follow-up session. This workshop is meant to be an opportunity for all the members to discuss not only their specific role, but that of the subcommittee as a whole. The estimated cost is \$20/person, which Bill Murray will collect and provide to the Children's Defense Fund.

*Discussion* included:

Two members could not attend on July 31. Ms. Dalton will check to see what other dates the lodge may have open and send out an e-mail. Currently, 8-10 people can attend.

Ms. McNally **moved to proceed with the proposed training session**. The motion was seconded. With ten in favor and two opposed, **the motion carried**.

### **Unfinished Business**

*ORRHES Vice Chair*. Ms. Dalton stated that, if the ORRHES wishes to proceed with a request for a Vice-Chair, the same process used for the members' selection would have to be used. That person would need specific roles and duties. CDC does not encourage Vice Chairs. it can be requested, but none of the other Subcommittees have one. If Dr. Davidson is unable to attend, she would contact Ms. Dalton as the Designated Federal Official to advise her of that, and she could ask a member of the Subcommittee to act in that capacity.

*Discussion* included:

Dr. Davidson expressed her interest in having someone assume part of the Chair's workload. The Vice Chair would have specific duties well beyond substituting as Chair.

Mr. Johnson: *What would be the process to select a Vice Chair, what criteria would apply, etc.?* Ms. Dalton responded that, in view of the time this would require, the best choice probably would be to nominate a Subcommittee member. With 19 members and two vacancies, it is uncertain if the Agency would support adding an additional member beyond those.

Dr. Eklund suggested delegating some of the Chair's workload to a person or a workgroup rather than pursuing a Vice Chair.

Dr. Brooks **moved to table the topic indefinitely** and the motion was seconded. The purpose of such a motion is to kill the topic without committing an opinion on it. He felt that

in the unlikely event that Dr. Davidson cannot make a meeting, someone could be appointed to take her place, and time would be wasted discussing the issue. Dr. Davidson called the question. With 15 in favor of tabling the motion and none opposed, **the motion passed.**

*Nominations for the Ill Worker ORRHES representative.* Ms. Dalton reported that the nominations for the ill worker closed on April 30, and produced applications that are now being considered. However, the hiring freeze on special government employees prevents taking on any other members, leaving that vacancy and that from Dr. Lands' resignation. Another solicitation can be issued for another physician or another individual, or the applications previously received can be re-reviewed, which may include a self-identified ill resident. However, whatever the Subcommittee decides cannot be effected until the freeze is lifted.

*Discussion included:*

Mr. Pardue: *Is there an application from another oncologist?* (No.) So we could not replace his expertise. *The DOE FACA committee is adding 3-4 new members; are they not covered under the freeze?* ATSDR's White House liaison confirmed that the freeze is still in effect. Although sometimes waivers are granted, there is no waiver for ATSDR for this.

Mr. Hanley stated that, considering the time required to nominate and seat a member, it would be worthwhile to begin the process.

Ms. Mosby commented on the record that at almost every meeting there is public comment that this group does not seem to want a sick person or a sick-identifying person as a member. She did not share that opinion; and in fact understood that some members are sick. She suggested that a collective biography of the Subcommittee be developed to challenge those comments without needing to force anyone to self-identify. She felt the level of expectation for anyone so identifying to be completely unrealistic, since no one could be a universal representative, just as she could not represent the views of all the Oak Ridge area African-Americans.

Ms. McNally supported the idea of opening up the solicitation process, having heard much more public awareness of and interest in of the ORRHES' existence.

Mr. Akin asked how the Chair wished the members to respond to public comments.

Dr. Davidson responded that she will appreciate being informed if the members feel there is a strong need to respond; that can be done at the meeting's next session.

However, she wished to avoid any back-and-forth heated debate during the public comment period, as has occurred in other Subcommittee meetings.

Mr. Akin recalled that Ms. Scopes had asked about the possibility of waivers to allow the participation of an ill worker without hazarding their compensation, and had the sense it was not addressed. However, Ms. Dalton recalled that the resolution was that the person needed to address those questions with their own legal counsel.

However, Ms. Mosby felt that some response should be provided as able at the time of the public comment, either a reference to past minutes if it has already been answered or

a commitment to respond in future. In fact, the Website would be a good place to post repeated inquiries. There was a general feeling, voiced by Ms. Galloway, that the Subcommittee needs to exercise every effort to make the public feel as welcome and included in the meeting as possible.

**Dr. Eklund moved to establish a position for a self-identified sick resident and to solicit nominations.** Ms. Kaplan seconded the motion. Mr. Washington apologized for missing much of the meeting, and agreed with Dr. Eklund. He felt that this is critical to establish the credibility of the Subcommittee's work. Dr. Davidson noted that this motion was for a sick resident, to replace Dr. Lands. Ms. Dalton asked if a specific type of person was desired to replace Dr. Lands, noting that the ill resident had been raised several times.

### **Public Comment**

*Dr. Bob Peelle* recalled that the state Health Department advertised for public input, whose comments are recorded in the study database along with many other public comments over the years. He suggested that these be reviewed, as they may well be applicable to the ORRHES as well. If they are not in the database, Pat Turrey of the Health Department can help gain access to those comments, following Tom Widner's directions (on the table at this meeting) of how to gain access to ORHASP materials.

*Mr. Walter Coin* stated that the last iodine report was watered down. In 1954, ~4,000 curies were released to the air and went all way to Oliver Springs. Boron and other elements also went in the air; the water supply was never discussed; and many accidents at Oak Ridge have never been told. A 1954 nuclear blast in the Pacific was 2.5 times bigger than expected. Many Marshall Island residents were contaminated and many military people were contaminated, and not one ever got any help.

*Mr. Dwight Napp* appreciated the committee's thoughts about ensuring that there is some interaction with the public. Regarding the Social Security question, he stated that their rules indicate that anyone who has the ability to waive their rules for any period of time demonstrates the ability to work, and hazards their benefits. That is one reason that people may be hesitant to participate. And it is difficult for someone who is ill to sit in a meeting for two days. Allowing an alternate would be helpful for those people. He felt that it should be obvious that the public should have the right to ask the committee questions. Regarding a self-identified ill person on the committee, he understood the issues of medical privacy, and he agreed that there may be unrealistic expectations of that person. But there should be a person on the committee with intimate personal knowledge of the effects of exposure, perhaps who had had such related therapies as chelation therapy. In addition, this contamination must be viewed in context, of a time when there was allegedly no mercury released; then that it did not go into the environment; and now people are trying to understand that they have mercury in their bodies. He charged that people were not only contaminated but also researched for health effects, and bodies were exhumed for

research without notifying their families. These are all public record and were written about in *People* magazine a couple of months previously. He wished the committee well in its work in addressing such issues.

*Ms. Linda Gas* stated that the issues of the workers are very different from those of the residents. The the perspectives of both ill workers and residents should be represented on the Subcommittee, by people who are not only self-identified but with some history of work with an organization of health-affected persons. The board needs to be more public-friendly; note should be taken of the persons who are conspicuously absent month after month.

Dr. Davidson noted that a **motion was on the table to nominated an ill residents to the Subcommittee**. She asked if anyone had anything new to add to that discussion.

Mr. Washington reported that a FACA committee on which he has served had granted waivers to persons to continue to receive SSI benefits while they continued to serve. Mr. Hanley noted that ATSDR had contacted the Social Security Administration office as promised when this issue was first raised, which invited all those interested to come in to discuss it. The person who originally raised the question was advised by her own counsel not to participate. However, ATSDR welcomed all who wished to participate in the workgroups, which is where much of the Subcommittee's work is done. He also noted that under its charter, this committee charged to advise CDC and ATSDR, but not the SSA directly. Mr. Johnson called for vigorous outreach to the SSA to ensure that applicants will not be harmed by participation. However, while the intent behind this was appreciated, the Subcommittee was warned that doing so could open themselves to potential legal liability. The people themselves must ensure their own rights and responsibilities.

The motion was re-raised and clarified to pertain only to nominate a sick resident. The solicitation for a sick worker representative has been issued and nomination packages have already been prepared. Dr. Eklund urged the committee to support his motion regardless of the disability issues. A vote on this will indicate to the public the committee's cognizance of this deficit in representation, and there is a good chance that someone appropriate could be found. Dr. Davidson called the question; as a major decision that impacts the structure of the subcommittee. The vote was ten in favor, six opposed. The two-thirds majority required was not met, and the motion failed.

Ms. Mosby **moved to open the nomination process and that preference (not exclusionary priority) be given to a sick resident**. The motion was seconded. Mr. Pardue hoped the board would encourage a medical professional to apply. The vote was taken, with 12 in favor, two opposed, and one abstention. **The motion carried**.

Mr. Kuhaida asked Ms. Gas for her suggestions as to how the meetings could be made more public-friendly. She stated that the audience should not be so dominated by agency

members from Atlanta, and less domination of the board by Dr. Brooks and Dr. Davidson. The latter pointed out that the agency staff attend to respond to the Subcommittee's concerns. She added that no member of the Subcommittee can speak for her, as anyone who knows her would testify.

### **Closing Comments**

Dr. Davidson deferred the members' discussion of their expectations of this Subcommittee to the workshop. Final statements included Ms. Sonnenburg's request that if the ATSDR staff returned to provide their critique of "Cancer Mortality Near Oak Ridge", that the author also be invited to explain and defend his report. Dr. Davidson referred that to the Agenda Workgroup. Dr. Brooks noted that `gano had presented his paper in Oak Ridge several years ago, so Oak Ridge had heard his viewpoint. He also assured the committee that he would post any agenda information desired on the ORRHES Web page.

Ms. Sonnenburg also asked to follow up on Ms. Stokes' idea of a health clinic. The Local Oversight Committee, on which she also serves, had passed such a recommendation a year earlier. She **moved that a Workgroup be established to investigate the feasibility of opening such a clinic in Oak Ridge.** Ms. Dalton pointed out that the clinic is under HRSA's purview's domain, not ATSDR's. Ms. Sonnenburg noted earlier comments that ATSDR can advise other agencies, and assumed that this also pertained to HRSA. Ms. Dalton responded that of course ATSDR would consider any recommendation from the Subcommittee and inform the members of their response, but she could not promise any particular outcome. Ms. Sonnenburg persisted that nothing could be done without examining the idea for its merit. Dr. Davidson recalled the suggestion at the last meeting that HRSA be invited. Ms. Dalton reported ATSDR's contact with HRSA, but no response yet as to when they could attend. A follow-up was requested. Ms. Dalton reiterated that this is beyond ATSDR's domain, but also noted that ATSDR conversations with HRSA are not unusual. Ms. Sonnenburg asked if a motion would help. Ms. Dalton could not say that it could. Dr. Davidson defined this as an action item for ATSDR to pursue the Subcommittee's request to ask HRSA to attend to speak to the Subcommittee.

Mr. Lewis commented that "communication is what the receiver understands, not what the sender says." He called for clarification to the community that the focus of the ORRHES' activity will be in the Workgroups, if that is how it will work. Using the Oak Ridge calendar would help in that area. Ms. Dalton noted that Mr. Murray had put this meeting on that calendar; the same could be done for the workgroup meetings. Dr. Davidson will also forward to the Workgroup Chairs her list of people interested in participating, so that announcements of the meetings can be sent directly to them.

Mr. Johnson asked if ATSDR could write to **UNOS (phonetic)** to ask how they obtained the exception to the disability rule that he had referenced earlier. Ms. Dalton agreed to take

this up with ATSDR's management. He then stated that, if convincing evidence of the need for a clinic is taken forward, particularly to public officials, then a clinic will be opened. Otherwise, he feared the funding would be taken out of ATSDR's budget.

Ms. Kaplan suggested arranging standing meeting times for the Workgroups. She asked if another workgroup should be set up to review "Inconclusive by Design." Dr. Eklund clarified that his intent was not to set up a workgroup, but to refer it to whatever workgroup is appropriate.

Mr. Johnson called for a different meeting time to be set so that the public can attend, not during working hours. Dr. Davidson noted that the meeting's first day begins later in order to extend into the evenings. She also encouraged the workgroups to meet in the evenings, particularly those that pertain to the public health assessment. In response to Mr. Hill's report that many of the skilled craft workers get off at 3:30 p.m. and the best time for them to attend the meetings would be from 4:00 to 6 or 7 p.m., the Agenda Workgroup had scheduled the I-131 discussions for those times. The attendance was good. Mr. Johnson persisted that those who get off at 5-6 p.m. should also have an opportunity to hear the full discussion of the Subcommittee, which would require meeting from 7:30-8:00 p.m. Mr. Lewis stated that the Subcommittees and Workgroups had bent over backwards to set up meetings at times convenient to most people.

Ms. Kaplan asked for the tour guide's data, and Dr. Widner's overheads from the previous day.

### ***Action Items***

Dr. Davidson reviewed the action items from this meeting:

Provide a brief program of work for the health needs assessment; Dr. Brooks will send a copy to be edited.

Ms. Nesmith and Dr. Paranzino will develop a fact sheet about the health needs assessment process.

An additional "Epidemiology 101" course was offered to the committee

Why arsenic was not screened for the ORNL

ATSDR will follow up with HRSA about providing a presentation at a future meeting.

ATSDR will advertise workgroup meeting on the Oak Ridge Community Calendar.

The members will provide comments on the community input form and the fact sheet; and the communications committee will work on a procedure for capturing public questions.

Mr. Washington requested the emissions data on the plutonium fire at ORNL; Dr.

Davidson suggested that be brought up to the Public Health Assessment Workgroup. She also noted that its agenda is growing, so patience may be necessary.

### ***Housekeeping Issues***

Ms. Dalton provided ATSDR's new telephone numbers; her direct line is 404-498-1743.

Mr. Hill requested an e-mail with everyone's names and numbers, and a new roster. Dr. Eklund announced his new e-mail address at rheklund@earthlink.net. The start time for the September meeting is at noon on September 10-11 and then December 3-4. Ms. Dalton asked that any information to be circulated be sent to ATSDR in the time requested. A press release was developed to announce the products of this meeting, which will be provided to the media outlets in Oak Ridge for distribution. She acknowledged Ms. Mosby's contributions in arranging for the Subcommittee's snacks and refreshments and asked the member to be sure reimburse her before leaving.

Dr. Davidson asked all Subcommittee members who signed up for workgroups to attend either in person or by conference call, so that the workgroup can attain a quorum. Ms. Kaplan asked the members to RSVP and to respond to their e-mails. Ms. Palmer will get the information to those without e-mail by some other means.

Dr. Davidson asked again that a quorum to be maintained during Subcommittee meetings. With no further comment and her thanks, she then declared the meeting adjourned. The motions, recommendations and action items of this meeting are attached to this document as Attachment #5.

I hereby certify that, to the best of my knowledge, the foregoing Minutes are accurate and complete.

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Kowetha A. Davidson, Ph.D., Chair

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Date

### **Attachments**

1. Categorization of Materials Based on Screening Results (Table 2)
2. Program of Work, Oak Ridge Reservation Public Health Assessment Process
  3. Report of the Agenda Workgroup
- 4a. Communications and Outreach Workgroup Proposed Recommendations
  - 4b. Communications and Outreach Workgroup Proposed Strategy
5. Motions, Recommendations, and Action Items, June 2001 Meeting

## Subcommittee Motions and Recommendations, June 2001 Meeting

### Recommendations

1. A collective biography of the Subcommittee should be developed to challenge the comments about the need for the representation of an ill worker on the Subcommittee, without requiring anyone to self-identify.

### Motions

1. Ms. Sonnenburg **moved that the Subcommittee members and the public be allowed a limited amount of time after each speaker to ask questions and that each speaker be encouraged to limit their remarks to 30 to 40 minutes.** Vote: 10 in favor, 5 opposed; **the motion passed.**
2. Dr. Brooks **moved that the ATSDR Program of Work for the public health assessment be adopted as a living document expressing the future tentative plans and schedule of the task.** He withdrew the motion and this was referred to the Public Health Assessment Workgroup to decide if the flow chart includes all the steps necessary.
3. Dr. Brooks **moved that the Subcommittee request from ATSDR and GWU/Hahneman the brief information necessary to form a program of work and a milestone chart for the public health needs project, similar in content to those of the public health assessment project.** Vote: 14 were in favor, none opposed; **the motion carried.**
4. Ms. Sonnenburg **moved to accept the Guidelines and Procedures Workgroup's report on major recommendations.** The motion was seconded. Vote: 15 in favor, none opposed. **The motion carried**
5. **A motion was made and seconded to accept the Guidelines and Procedures Workgroup's recommendation** on procedures for individual Subcommittee members submitting material to ATSDR for distribution to the Subcommittee. Vote: 14 in favor, one opposed. **The motion carried.**
6. **A motion was made and seconded to accept the proposed Communications and Outreach Strategy.** Vote: 14 in favor, none opposed. **The motion passed.**
7. **A motion to accept the Communication and Outreach Workgroup's proposed list of recommendations to ATSDR** was seconded. Vote: 13 in favor, none opposed, **the motion passed.**
8. Ms. McNally **moved to proceed with the proposed team-building training session** at the Children's Defense Fund Lodge. The motion was seconded. Vote: 10 in favor, 2 opposed. **The motion carried.**
9. Dr. Brooks **moved to table the topic of an ORRHES Vice Chair indefinitely.** Vote: 15 in favor, none opposed. **The motion passed.**
10. Ms. Mosby **moved to open the nomination process and that preference (not exclusionary priority) be given to a sick resident.** The motion was seconded. Vote: 12

in favor, 2 opposed, 1 abstention. **The motion carried.**

## Action Items, July 2001 ORRHES Meeting

Reviewed by the Chair at the end of this meeting:

Provide a brief program of work for the health needs assessment; Dr. Brooks will send a copy to be edited.

Ms. Nesmith and Dr. Paranzino will develop a fact sheet about the health needs assessment process.

An additional "Epidemiology 101" course was offered to the committee

Why arsenic was not screened for the ORNL

ATSDR will follow up with HRSA about presenting at a future meeting, relative to their ability to establish a clinic at Oak Ridge.

ATSDR will advertise workgroup meeting on the Oak Ridge Community Calendar.

The members will provide comments on the community input form and the fact sheet; and the communications committee will work on a procedure for capturing public questions.

Mr. Washington requested the emissions data on the plutonium fire at ORNL; Dr. Davidson suggested that be brought up to the Public Health Assessment Workgroup. She also noted that its agenda is growing, so patience may be necessary.

Compiled during development of the minutes:

ATSDR will explore another date for the team building exercise at the Children's Defense Fund Lodge.

The Outreach and Communication Workgroup will discuss: 1) ways other than advertising to solicit concerns and information on contaminants, which also can be solicited at the beginning of the public comment periods; 2) development of a cross-referential document about the role of epidemiology and the public health assessment, relative to drawing conclusions about health hazards in a community as pertain to specific chemicals and their sources. (Perhaps Ms. Berger and Dr. Peipins can explain those differences at the next meeting.)

The Public Health Assessment Workgroup will evaluate the need for a formal mechanism to track needed for information, such as "Inconsistent By Design," that is not applicable to the source term or contaminant information but might offer good critical input.

The Agenda Workgroup will discuss inviting Dr. Mongano to the next meeting if his study is discussed.

Ms. Dalton agreed to consult with ATSDR's management about following up with UNOS (phonetic), per Mr. Johnson's suggestion, to ask how they obtained the exception to the disability rule that he had referenced earlier.