Radiation

August 17, 1966

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ATOMIC ENERGY COMMISSION

PROPOSED REPLIES CONCERNING LIVERMORE LABORATORY ESTIMATES OF THYROID GLAND EXPOSURES

Note by the Acting Secretary

The Assistant General Manager has requested that the attached memorandum of August 9, 1966 from the Acting Director, Division of Public Information, with attachments, be circulated for the information of the Commission.

F. T. Hobbs

Acting Secretary

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UNITED STATES GOVERNMENT

Memorandum

TO : R. E. Hollingsworth, General Manager
FROM : Howard C. Brown
Philippe G. Jacques, Acting Director
Division of Public Information
DATE: AUG 9 1966

SUBJECT: PROPOSED REPLIES TO INQUIRIES ON LIVERMORE LABORATORY ESTIMATES OF THYROID GLAND EXPOSURES TO RADIOIODINE IN THE U.S. (1952 THROUGH 1955)

DRAFT

Attached is an advance copy of a report entitled "Estimation of Dosage to Thyroids of Children in the U.S. from Nuclear Tests Conducted in Nevada during 1952 through 1955" (UCRL-14707).* Its authors, Drs. Tamplin and Fisher of Livermore's Bio-Medical Research Division, attempt to refine earlier estimates ranging from "a few tens of rads" to 400 rads of probable radioiodine exposure dose to children's thyroid glands in portions of western U.S. during 1952-1955, a period of atmospheric nuclear testing. The Tamplin-Fisher maximum estimated dose from radioiodine is 120 rads.

The Tamplin-Fisher report, prepared under AEC contract, has been discussed within the scientific community and in meetings with other government agencies. We expect it to receive attention in "Scientist and Citizen" published by the St. Louis Committee on Nuclear Information.

Attached for your approval are answers proposed for use in response to news media inquiries which may result from distribution of the Tamplin-Fisher report. Dr. Tamplin has asked that we expedite clearance of these so that the laboratory may proceed with issuance of the report. The Divisions of Biology and Medicine and Operational Safety, the AEC's San Francisco and Nevada Operations Offices, and the Assistant General Managers for Research and Development and for Operations have concurred in the responses. We will send copies of the approved questions and answers with a copy of the report to the Commissioners after a distribution date has been set.

Attachments

APPROVED:

For General Manager

8-16-66
Date

*Editorial Note: The report is on file in the Office of the Secretary.

Tamplin Report, UCRL-14707

Proposed Responses to Anticipated News Media Inquiries

Q. Under what Commission program were these studies undertaken?

A. The Lawrence Radiation Laboratory, Livermore, fallout studies program was initiated in the spring of 1963. This project is a part of the Commission's bio-medical research program. AEC has been studying environmental contamination since the late 1940s. The Livermore studies place special emphasis on early fallout -- that fallout which follows a nuclear detonation within hours or days.

Q. What is the purpose of the Tamplin-Fisher report?

A. The report is being published now in order to present their best estimates of the dosage from an analysis of the presently available data and to solicit any pertinent additional data and any useful criticism that will permit improvement of the analyses.

Q. To what extent was the area around the test site monitored for iodine following the 1952-1955 tests?

A. Gross measurements of environmental radioactivity which include some contribution from radioiodine have been made in the off-site area since nuclear testing began. Monitoring during this period did not specifically include analyses of radioiodine in fresh milk, principally because currently available spectrometers for prompt analysis of large numbers of milk samples were not then available to the field laboratories.

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Q. Why do we re-examine past data on radioactive fallout?

A. To determine, as accurately as possible, past levels of radiation exposure and to pin down, as best as we can, the significance of internal exposure to radioactive fallout, including radioiodine.

Q. Why are children, or infants, studied?

A. Children and infants are studied because their thyroids are more radiation sensitive than those in adults. Furthermore, children drink relatively more milk, which is the prime source of iodine-131. They also have smaller thyroids which tend to contain higher concentrations of iodine-131.

Q. On the basis of current knowledge are any of these children in danger?

A. No. If one may judge from recent PHS studies of thyroid disorders in the Utah-Arizona area, no evidence has been found, to date, that implicates fallout radiation as a source of the thyroid conditions detected. Of course, these conditions are thought to be reasonably common in the U.S. population at large.

Q. To what extent have population groups outside of the Nevada Test Site vicinity been exposed to radioactive iodine from Nevada tests?

A. Available information indicates that the iodine fallout was considerably less country-wide than in the areas around the test site. The Tamplin-Fisher report covering the years 1952-1955 supports this view.

Q. Was the possibility of exposure to radiation publicized in the early years of testing?

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9. A. Yes. The situation was the subject of public announcements of the day, and was further reported in the Commission's annual reports to Congress and in the 1957 and 1959 Congressional public hearings on fallout, and subsequent AEC testimony before Congress which, in effect, updates the earlier hearings.

9. Q. What is the principal uncertainty element in these reports on fallout?

A. For the most difficult, on the basis of the most authoritative advice available from scientists in and outside government, external gamma radiation exposure was believed to be the limiting factor in health protection. Primarily for this reason, measurements of iodine-131 in milk were not a part of the early surveillance programs of that time. The uncertainty arises in the attempt to establish relationships between measured external gamma levels and the amounts of radioiodine probably present in milk. Estimates of total exposure to the thyroid glands of children in the vicinity of the Test Site range from a few units (rads) to several hundred units. These matters were discussed in detail in the Congressional fallout hearings of 1959, 1962, and 1963 and have been re-explored in several technical and semitechnical reports in an effort to refine the data to the degree possible.

10. Q. Will we ever know what levels of iodine were present?

A. It is unlikely that we shall know with any exactness what iodine levels occurred in specific areas in the early 1950s.

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11. Q. How do you explain the attention paid iodine-131 today as contrasted with the early 1950s and are there other radionuclides that may have been overlooked in these earlier years?

A. There was general agreement in the 1950s among the scientists concerned both in and out of government that external gamma dose was the most important hazard from early fallout. Strontium-90 was considered to be a secondary factor and iodine-131 even less of a problem. This reasoning was based partly on the then current criteria for iodine-131 and partly on the recognized transient nature of iodine-131 and on the relatively low amounts found in the thyroids of animals. Changes from these earlier views are reflected in the testimony before the Joint Committee in 1959 and in subsequent years, especially 1963. While there may be wide technical disagreement on interpretation of the data and the magnitude of the problem, there is agreement now that iodine-131 can, under certain circumstances, be of greater significance than external radioactivity, and in some cases, may be the fission product of primary health concern. The Livermore bio-medical program is taking a critical look at each and all radionuclides that would be produced in the detonation of a modern device and is determining their significance as possible hazards to man.

12. Q. What does the Tamplin-Fisher report mean in terms of continued nuclear weapons testing?

A. As you may recall, the limited test ban treaty of 1963 prohibited nuclear tests in the atmosphere by the more than 100 signatory nations. Testing between 1946 and 1963 was conducted principally

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in the atmosphere. At the Nevada Test Site, tests are conducted underground with only occasional releases of radioactivity in the vicinity, which are extremely small compared with the amounts released by atmospheric tests.

13. Q. We have heard recent reports that thyroid nodules, virtually all benign, have been found in Marshallese people, who, as children, were exposed to fallout radiation in 1954 in the Pacific. Have we seen any such effects in children in the Continental United States?

A. No. There is no clinical evidence of injury attributable to fallout in U.S. children to date.

14. Q. What is the Commission's opinion of the Tamplin-Fisher report?

A. The Commission has not expressed an official view. The highest dose estimated by Drs. Tamplin-Fisher (120 rads) is within the rather wide range of dose estimates in various technical reports over the past several years and mentioned in past Congressional fallout hearings.

15. Q. What are some of the shortcomings of the Tamplin-Fisher report?

A. This report is an attempt to come to the best estimate on the basis of what are admittedly fragmentary data. The situation results in the following shortcomings: 1) unavoidable handicaps such as the lack of good data on iodine in milk at the time of the tests, and the amount actually measurable in the human

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thyroids during periods of intake after these early tests; 2) the report's dependence on the gummed-film data which show considerable scatter; and 3) the defect emphasized by the authors themselves -- that the cows may not have been on pasture but on dry stored feed at the time. These, as the authors acknowledge, would result in lower iodine-131 concentrations in milk and, hence, lower thyroid doses than those presented in the charts accompanying the report.