



10 DOWNING STREET

THE PRIME MINISTER

25 February 1980

You wrote to me on 4 October concerning a report in "The Lancet" of 15 September 1979 about an increase in the incidence of leukaemia in western Lancashire. In my reply of 22 October I told you that I had asked the Departments concerned to study the report, to obtain the latest available date and to seek advice. I am now able to let you have the results which are set out in the attached paper.

I hope that the information in the paper will help to reassure you about the matters discussed in the article. These are not problems which can be settled overnight; the situation will continue to be monitored and further research is likely to be carried out as described at the end of the paper.

As a number of other Members have expressed interest in this subject, I am arranging for copies of the paper to be sent to them.

(SGD) MARGARET THATCHER

S.G. Thorne, Esq., MP.

JS.
c DHSS
DIN
DOE
DIN
MAFF

Home Affairs

VS

**DEPARTMENT OF HEALTH & SOCIAL SECURITY**

Alexander Fleming House, Elephant & Castle, London SE1 6BY

Telephone 01-407 5522

From the Secretary of State for Social Services

Nick Sanders Esq
Private Secretary
10 Downing Street
London
SW1

Rsatt
2 February 1980

Dear Nick

You wrote to me on 18 January and also spoke to officials here about the incidence of leukaemia in Lancashire.

We have recast the proposed reply from the Prime Minister to Stan Thorne MP so that it is now in the form of a short covering letter to a paper. The paper incorporates most of your suggestions and has been cleared with the other Departments and advisory bodies concerned.

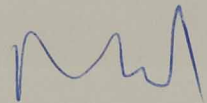
You suggested in your letter that the draft should mention "the important work which has been done on health among Windscale workers themselves". We understand that you meant by this the registry of present and past radiation workers which is being compiled by the National Radiological Protection Board and we have included a reference to this in the last paragraph of the paper. However, the composition of a representative group of radiation workers, the radiation doses to which they are exposed and the conditions under which such exposures take place are very different from those applying to the general public. Thus it seems to us that arguments comparing the incidence of leukaemia for radiation workers with that for the general public are not very relevant to the subject of the Lancet article. We understand moreover that British Nuclear Fuels Ltd does not normally monitor workers on the Windscale site who are not likely to be more exposed to radiation as part of their job than the general public. Neither the Department of Energy nor the Health and Safety Executive wished to add anything to the draft paper on this subject, although they were invited to do so, and you may feel therefore that the paper should not refer at all to the registration work as this could lead to an extension of the discussion into areas which have little to do with the initial subject.

If you are content for the paper to be sent to Mr Thorne, we will arrange for copies of it to be sent to the various MPs who have expressed interest and use it as far as possible to answer any further enquiries. In our view the paper

E. R.

should not be published more widely as this could well give rise to more disquiet and controversy than it stilled. While the paper does attempt to reflect in a straightforward manner current thinking and specialist advice, the issues are complex and there are those who are strongly opposed to the medical and scientific bases on which it rests. The paper seeks to reply to a particular article on one aspect of radiation protection and there would be dangers in attempting to convert it into a major statement on the whole subject. If such a statement were required, I understand that we would need to employ the assistance of a specialist advisor for its compilation.

I am copying this to the recipients of your letter.

Yours ever
Bernie 

B C MERKEL
Private Secretary



*With the Compliments of
the Private Secretary to
the Secretary of State*

DEPARTMENT OF HEALTH AND SOCIAL SECURITY
Alexander Fleming House
Elephant and Castle
London, SE1 6BY

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DRAFT LETTER FROM THE PRIME MINISTER TO
MR THORNE MP

You wrote to me on 4 October concerning a report in "The Lancet" of 15 September 1979 about an increase in the incidence of leukaemia in western Lancashire. In my reply of 22 October I told you that I had asked the Departments concerned to study the report, to obtain the latest available data and to seek advice. I am now able to let you have the results which are set out in the attached paper.

I hope that the information in the paper will help to reassure you about the matters discussed in the article. These are not problems which can be settled overnight; ~~and I am therefore pleased that~~ the situation will continue to be monitored and ~~that~~ further research is likely to be carried out as described at the end of the paper. ^{para} As a number of other Members have expressed interest in this subject I am arranging for copies of the paper to be sent to them.

LEUKAEMIA IN LANCASHIRE

1. 'The Lancet' Article

1.1 An article in "The Lancet"¹ of 15 September 1979 said that the reported incidence of myeloid leukaemia and associated disorders in Lancashire had almost doubled in the area as a whole and in two districts had nearly trebled between two consecutive six-year periods beginning in 1965. It suggested that this increase was substantially larger than mortality data suggested had occurred nationally in the same period and that it was unlikely to be due solely to more accurate diagnosis or reporting. The paper went on to suggest that, if the observed increase was a real one, the possibility that it was due to leukaemia-causing factors in the environment should be considered. The authors were unable to identify any chemical factor which might be responsible but observed that monitoring of radioactivity in coastal waters and fish off North-West England had shown there to be a steady rise in the radiation exposure of the population in the area over the past 10 to 15 years.

2. Leukaemia

2.1 Leukaemia is a malignant disease involving the white blood cells. There are several distinct types of the disease of which myeloid leukaemia is one. In the majority of cases the cause of leukaemia cannot be determined but there are some factors which are known to increase the risk of developing it, including exposure to high doses of gamma radiation, exposure to X-rays before birth, exposure to certain chemicals - eg benzene; and inherited abnormalities eg mongolism.

3. Available Data

3.1 Copies of the relevant data provided by the Office of Population Censuses and Surveys (OPCS) for both myeloid leukaemia and all forms of leukaemia are attached. Data on the incidence of leukaemia derived from registrations of new patients suffering from the disease must be distinguished from data on those who have died from leukaemia. It is unfortunate that the article in "The Lancet" compares new registration data for Lancashire with national mortality data.

3.2 The reliability of the data on new registrations recorded at NHS regional cancer registries depends on the efficiency of the system in hospitals to ensure that all cases of the disease occurring in the region are notified to the registry and on the accuracy with which the particular type of leukaemia is identified. Some regional registries carry out extensive checking procedures to verify the data before submitting them to OPCS for collation. Published national incidence figures are available only to 1973 at present.

3.3 Data on mortality are separately derived by OPCS from the analysis of death certificates. Their reliability depends upon the accurate and careful completion of the cause of death on the certificates.

3.4 Registration and mortality data from before 1968 are not strictly comparable with more recent data because of a revision of the International Classification of Diseases at that time. Myeloid leukaemia is separately identified for the first time from 1968 in the national statistics prepared by OPCS. The direct comparison of the national statistics with those reported in "The Lancet" for Lancashire can therefore only be made for 1968-1970 in the first period and 1971-73 in the second.

3.5 It is clear that registration rates generally for leukaemia have increased between 1968 and 1973 and that changes of the order of those reported from Lancashire have taken place in other regions at different times over the period. The fact that the mortality figures generally do not indicate increases of the same magnitude as registration data may well be the result of more complete registration and of the improved results of modern treatment methods.

3.6 To summarise, all the data must be interpreted with caution because the actual numbers involved, particularly at district level, are so small, the period for which they have been recorded is relatively short and both the age structure of the population and the efficiency of the registration system varies from region to region.

4. Radioactivity in Coastal Waters as a possible cause

4.1 The Medical Research Council has been consulted about the suggestion that recent increases in radioactivity in the coastal waters, fish and shell fish of the North Irish Sea might be a cause of the reported increase in registration rates in Lancashire.

4.2 The Council has advised that observations of leukaemia among atom bomb survivors and patients who have undergone exposure to radiation for medical purposes have led the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) to estimate that the risk of inducing leukaemia by radiation is about 20 cases per million people exposed to an average dose of one rem (a measure of radiation dose which takes into account the differing biological effects of different kinds of radiation) to those organs which form blood (principally bone marrow). The mean interval between exposure and diagnosis of the disease is estimated to be about 10 years. Therefore for radiation to have been responsible for the reported increase of 20 cases per million per year between 1965/70 and 1971/76 each member of the population of Lancashire would have had to have been exposed to about one rem more on average in each of the years 1961/1966 than they were in the previous five years. There is no evidence that the people of Lancashire have ever received more than a minute fraction of this dose rate to the relevant tissues of the body.

4.3 The rises in radioactivity over the past years, which are recorded in the monitoring reports of the Fisheries Radiobiological Laboratory of the Ministry of Agriculture, Fisheries and Food could not, even at their highest, have given rise to radiation doses to the population sufficient to account for the reported increase in new cancer registrations in Lancashire.

5. Radiation Dose Limits and Control

5.1 The International Commission on Radiological Protection makes recommendations on the radiation dose limits which should be observed to ensure the health protection of the public and of radiation workers against the hazards of ionising radiations. These recommendations take account of the latest scientific evidence on the effects of radiation and the views of such international organisations as UNSCEAR. The National Radiological Protection Board is directed by the Health Ministers to advise relevant authorities in this country on the application of these dose limits. In England, the Department of the Environment and the Ministry of Agriculture Fisheries and Food are the relevant authorities for the control of the amounts and means of disposal of radioactive waste from nuclear installations under the terms of the Radioactive Substances Act 1960. Their control is exercised by authorisations, and subsequent monitoring, which ensure that any radiation exposure to the public as a result of such discharges remains at a small fraction of the recommended dose limits. The discharge limits set by authorising Departments for Windscale have never been exceeded.

6. Further Action

6.1 The Leukaemia Research Fund and the Cancer Research Campaign are interested in undertaking further studies in co-operation with the Department of Health and Social Security and the Medical Research Council. These could include some major epidemiological studies of childhood cancer, including leukaemia, in the Midlands and northern England and some prospective studies in childhood and adult leukaemia in other parts of the country. The MRC's Protection against Ionising Radiation Committee and the National Radiological Protection Board are also being asked to keep the subject under review. The Board is also compiling a registry of past and present radiation workers and the radiation doses to which they have been exposed which will provide further data on the relationship between exposure to radiation and mortality from diseases such as leukaemia among radiation workers.

References

- 1 "Incidence of Myeloid Leukaemia in Lancashire", C G GEARY, R T BENN, I LECK
The Lancet 15 September 1979 pp 549-551
2. See also letter to "The Lancet" of 22/29 December 1979 "Incidence of Myeloid Leukaemia in Lancashire" by K F BAVERSTOCK, D G PAPWORTH and J VENNART.

NEWLY REGISTERED CASES OF MYELOID LEUKAMIA-RATES PER 100,000 POP, BY YEAR AND HOSPITAL
REGION OF RESIDENCE
MALES AND FEMALES

YEAR	ENGLAND & WALES	HOSPITAL REGION OF RESIDENCE														
		Newcastle	Leeds	Sheffield	E Anglia	NW Metrop	NE Metrop	SE Metrop	SW Metrop	Wessex	Oxford	S Western	Wales	Birm	Manchester	L'pool
1968	Males 2.6	3.3	3.0	2.4	2.1	2.6	2.2	3.6	2.3	2.4	3.6	2.4	2.0	2.5	2.5	2.1
	Females 2.2	2.8	2.0	2.0	2.0	2.2	1.5	3.1	2.0	1.8	2.1	2.2	2.0	2.3	1.6	3.4
1969	M 2.5	2.8	2.2	1.8	2.9	2.9	2.1	2.7	3.0	2.1	2.5	2.7	2.3	2.3	2.7	2.3
	F 2.3	2.7	1.7	1.6	2.6	2.6	1.8	2.9	3.2	2.2	3.5	1.7	1.6	2.7	2.1	2.7
1970	M 2.7	3.1	1.7	2.1	1.7	2.8	3.0	3.4	3.4	3.1	3.0	2.8	2.6	2.5	2.4	2.3
	F 2.2	2.3	2.0	1.5	2.2	3.0	1.5	2.6	2.5	1.4	1.8	2.3	1.8	2.8	1.9	2.4
1971	M 3.1	2.9	2.4	2.1	3.0	3.4	3.1	3.3	2.9	3.2	4.1	3.5	2.7	4.0	2.8	2.6
	F 2.7	2.7	2.0	2.1	3.2	2.8	2.7	2.8	3.7	2.0	3.4	2.7	2.5	2.7	2.3	3.2
1972	M 3.5	4.5	1.7	3.2	3.7	4.3	3.1	3.7	3.9	2.7	4.9	3.5	3.5	3.5	3.2	3.3
	F 3.0	3.9	2.3	2.7	2.9	2.5	2.4	3.3	3.8	1.1	3.6	3.8	2.3	3.1	3.2	4.3
1973	M 3.5	3.1	3.2	3.5	3.4	3.4	2.6	3.2	3.1	4.0	3.0	4.7	3.7	3.8	3.9	4.0
	F 3.1	3.5	2.8	2.8	3.3	3.1	3.4	2.9	2.9	2.7	2.2	2.7	3.2	3.5	3.9	3.1

Deaths from leukaemia - 1959 to 1977

Regions*

1

MALES

	United Kingdom	Scotland	Northern Ireland	Wales	England	Newcastle	Leeds	Sheffield	East Anglian	North West	North East	South East	South West	Wessex	Oxford	South Western	Birmingham	Manchester	Liverpool
1969	1776	53	60	97	1566	105	133	147	44	148	122	124	143	70	55	108	168	138	61
1970	1737	61	48	81	1547	113	103	175	47	138	115	133	115	77	77	97	152	138	67
1971	1741	48	51	90	1552	95	101	165	64	149	101	126	113	67	57	115	183	154	62
1972	1744	66	44	89	1535	124	90	114	69	155	91	130	124	66	71	121	167	150	63
1973	1820	55	58	91	1602	117	104	148	49	167	115	146	106	81	61	117	170	146	75

FEMALES

1969	1479	52	39	71	1317	71	95	118	33	143	89	116	107	52	62	91	147	137	56
1970	1450	51	43	62	1294	69	99	107	54	139	91	122	115	54	46	82	121	119	76
1971	1467	56	34	82	1295	83	93	114	46	138	89	137	100	58	43	89	125	118	62
1972	1590	61	39	72	1410	96	88	136	46	134	95	104	115	67	60	116	156	126	71
1973	1430	52	40	64	1266	80	98	116	49	109	95	101	114	47	41	81	149	125	61

MALES

	United Kingdom	Scotland	Northern Ireland	Wales	England	Northern	Yorkshire	Trent	East Anglian	North West	North East	South East	South West	Wessex	Oxford	South Western	West Midlands	North Western	Norsey
1974	1766	51	49	86	1566	81	116	158	68	114	134	114	110	97	73	127	174	123	77
1975	1881	74	54	94	1642	82	123	162	67	122	135	144	131	99	60	121	159	141	96
1976	1839	87	45	106	1590	81	117	142	59	135	106	155	115	102	70	123	181	122	82
1977	1863	94	58	86	1605	88	118	160	62	121	122	133	104	94	70	139	170	131	93

FEMALES

1974	1545	85	25	73	1356	87	99	117	57	101	114	114	84	67	54	105	138	133	86
1975	1550	67	42	77	1352	67	93	133	44	101	110	113	102	67	54	107	142	137	82
1976	1589	81	23	81	1395	81	105	112	48	112	120	151	97	68	54	90	135	137	85
1977	1610	82	40	98	1377	71	103	138	52	104	119	127	116	72	70	99	136	110	60

English Regions for 1969-1973 = Regional Hospital Boards
 1974-1977 = Regional Health Authorities

New Registrations of Leukaemia - 1969 to 1977 - Rates per million Population.

Regional Hospital Boards

Males																			
	United Kingdom	Scotland	Northern Ireland	Wales	England	Newcastle	Leeds	Sheffield	East Anglian	North West Metropolitan	North East Metropolitan	South East Metropolitan	South West Metropolitan	Wessex	Oxford	South Western	Birmingham	Manchester	Liverpool
1969	69	58	94	59	70	69	64	64	61	73	60	71	96	52	75	92	64	66	62
1970	68	62	71	60	69	75	50	56	46	68	68	85	91	76	63	93	66	67	55
1971	76	63	89	73	77	84	74	75	89	72	63	82	82	65	93	85	79	75	66
1972	80	70	77	86	81	97	60	88	92	93	61	79	92	57	86	96	75	76	73
1973	83	72	82	91	83	81	81	87	77	79	64	71	69	107	73	110	80	92	90
1974		59	81																
1975		73	92	Not yet available					Not yet available										
1976		70	74																
1977		73	95																
FEMALES																			
1969	54	38	57	40	56	49	47	46	51	60	47	69	77	61	75	57	55	53	52
1970	52	51	60	35	52	50	51	43	57	59	32	66	64	42	45	67	56	46	52
1971	56	47	45	61	57	59	55	51	51	57	50	62	73	37	68	60	56	55	59
1972	61	61	65	55	61	65	50	61	72	50	46	62	77	38	71	73	65	62	67
1973	63	50	56	73	64	58	59	59	71	56	58	62	62	72	51	70	66	77	77
1974		52	41																
1975		59	77	Not yet available					Not yet available										
1976		59	50																
1977		60	54																

21 FEB 1980



Death Rates per million population for Leukaemia, 1969 to 1977

Regions

MALES																			
	United Kingdom	Scotland	Northern Ireland	Wales	England	Newcastle	Leeds	Sheffield	East Anglian	North West Metropolitan	North East Metropolitan	South East Metropolitan	South West Metropolitan	Wessex	Oxford	South Western	Birmingham	Manchester	Liverpool
1969	66	21	81	73	70	69	85	64	51	71	76	76	91	73	57	72	66	63	66
1970	65	24	64	61	69	74	66	76	54	66	71	81	73	79	79	64	59	63	61
1971	64	19	68	68	69	64	65	72	73	72	63	77	72	68	57	75	72	70	58
1972	64	26	58	60	68	83	57	49	78	75	57	79	79	66	70	78	66	68	59
1973	67	22	76	68	71	79	66	64	54	81	72	89	68	80	60	75	67	66	70
FEMALES																			
1969	52	19	50	51	56	45	57	50	38	65	53	64	61	50	64	56	57	58	48
1970	51	19	55	44	54	44	60	46	61	63	54	67	65	51	47	50	46	50	65
1971	51	21	44	59	55	53	56	48	51	63	53	76	58	55	43	54	48	50	54
1972	55	23	50	57	59	62	53	57	51	62	56	58	66	62	59	70	60	53	62
1973	50	19	51	45	53	52	58	49	53	50	56	56	66	43	40	48	57	53	53
MALES																			
	United Kingdom	Scotland	Northern Ireland	Wales	England	Northern	Yorkshire	Trent	East Anglian	North West Thames	North East Thames	South East Thames	South West Thames	Wessex	Oxford	South Western	West Midlands	North Western	Mersey
1974	65	20	64	64	69	53	67	71	77	67	74	66	77	74	67	89	68	62	64
1975	69	30	71	70	73	54	71	73	75	72	75	84	92	75	54	84	62	71	50
1976	68	35	59	79	70	53	67	64	65	80	59	91	81	77	63	85	71	62	68
1977	69	38	76	64	71	58	68	72	68	72	68	78	73	71	62	95	67	67	78
FEMALES																			
1974	54	31	32	51	57	54	54	51	64	56	59	60	54	50	50	69	53	62	66
1975	54	25	54	54	57	42	51	58	49	56	57	60	66	49	49	70	54	65	64
1976	55	30	30	57	59	51	57	49	53	62	63	81	63	50	49	58	52	65	66
1977	56	30	52	69	58	44	56	60	57	58	62	68	75	53	63	64	52	52	47



10 DOWNING STREET

From the Private Secretary

18 January 1980

Dear Benie

Thank you for your letter of 14 January with which you enclosed a draft reply for the Prime Minister to send to Stan Thorne, M.P., about the incidence of leukaemia in Lancashire. As you know, I have had a word direct with the division in D.H.S.S. which has dealt with this matter and I am most grateful to them for sending me some more information about it.

I should be glad if, in consultation with other Departments as necessary, you could let us have a revised draft for the Prime Minister to send to Mr. Thorne. This issue seems to us to merit as full a reply as can reasonably be provided. Its content must be a matter for you and the other Departments concerned, but I hope that it will begin by summarising the suggestions which were made in the article in "The Lancet", go on to say something very short and simple about the nature of leukaemia and what is known about its causes. It could then discuss the comparison between the statistics quoted in the article and such national statistics as are available, drawing attention to all the qualifications which have to be made about them. Having demolished that part of the case, the rest of the draft could follow the order set in the original draft: a discussion of the effects of radiation and of the data available on radiation levels in the areas concerned. I think that it would be helpful if a separate section could refer to the important work which has been done on health among Windscale workers themselves.

Finally, the draft should describe action which has been decided on for the future.

The language throughout should be as clear as possible and aimed at the lay audience. Technical terms should be explained wherever they are introduced. The whole thing should be put, within reason, in the international context.

It might well be helpful to provide a separate review document and short draft covering letter for the Prime Minister to send to Mr. Thorne. Those other M.P.s who have

/ been promised

file vrb

coming asap. 1/2
20/2

DHSS will phone us back
today 20/2

Didn't come.
pls. ask again

Chase?

no need yet

ty on 15 Feb! MJC

Has been a mix-up!
Sending draft over
on Monday.
15/2

VB

been promised copies of the information could be sent copies of the report under a covering letter from your Ministers.

I am conscious that this request creates a good deal of extra work, but I think it is justified in the circumstances, given the importance of the issues involved and the need to get a document which can be made publicly available.

I am sending a copy of this letter to Bill Burroughs (Department of Energy), Ian Fair (Department of Employment), David Edmonds (Department of the Environment) and Garth Waters (Ministry of Agriculture, Fisheries and Food).

Yoneve

Nick Sade

B. C. Merkel, Esq.,
Department of Health and Social Security.



DEPARTMENT OF HEALTH & SOCIAL SECURITY
Alexander Fleming House, Elephant & Castle, London SE1 6BY

Telephone 01-407 5522

From the Secretary of State for Social Services

PO(S of S) 2018/25

The Rt Hon Albert Booth MP

17 January 1980

Dear Albert,

You wrote to me on 30 November conveying the concern of the Community Health Councils of Cumbria regarding levels of radioactivity in the Cumbria area in relation to the numbers of cases of myeloid leukaemia diagnosed and registered. This reply represents the comments of the Secretary of State for the Environment and myself on our respective areas of responsibility.

The Office of Population Censuses and Surveys has provided data for all the regions of England and Wales on mortality from leukaemia (unclassified) and on newly registered cases (from which it is possible to infer incidence), I am sending you a copy of these figures. Statistics for years before 1968 are not strictly comparable because of a revision of the International Classification of Diseases. Full national registration data are not yet available after 1973. It is clear, however, that registration rates for leukaemia have increased between 1968 and 1973 more or less countrywide and that changes of at least the order recorded in the North Western Health Region have taken place in other regions at different times over the period. For males the rate appears to be increasing in 13 of the 15 regions and for females in 11 of them. The currently available statistics are difficult to interpret because the numbers involved are small. To come to any reliable conclusions it would be necessary to have national data for each type of leukaemia over a longer period of time and to correct it to take into account the variations in age structure of the population in different regions.

It should also be borne in mind that in the last ten years advances have been made in the methods of identifying and categorising the leukaemias. Consequently doctors are now more likely to be able to make a primary diagnosis before the condition proves fatal and this will be reflected in the number of registered cases of leukaemias of a particular type and in the numbers of deaths attributed to leukaemia. It is, therefore, extremely difficult to determine the actual trends in the incidence of leukaemia for any single Region, or to identify the possible reasons for the higher figures recorded in recent years for registrations and mortality.

I understand that all discharges of radioactive wastes, whether to land, sea or atmosphere, are required to be authorised under the Radioactive Substances Act 1960. Authorisations are issued by the Secretary of State for the Environment except at licensed nuclear sites (such as Windscale and the nuclear power stations) where they are issued jointly by the Secretary of State for the Environment and the Minister of Agriculture, Fisheries and Food. In all cases the Ministers require that the disposals should be made in an approved manner so that they will not give rise to environmental hazards or result in unacceptable doses of radioactivity to the population. The authorisation to permit the Vickers Shipbuilding Group Ltd to dispose of solid low level wastes to the Company tip on Walney Island was issued by the Secretary of State for the Environment on the basis of advice from his Radiochemical Inspectorate and after consultation with the local authorities. The authorisation requires that the disposed wastes should be covered immediately by not less than two metres of inert material.

Monitoring of the effects of discharges is carried out regularly by the authorising departments and a comprehensive statement on the effects on the aquatic environment is published annually by the Fisheries Radiobiological Laboratory of the Ministry of Agriculture, Fisheries and Food. I enclose a copy of the most recent report (for 1977) which contains detailed information on measurements made in Cumbrian coastal areas. The Summary in Table 32 indicates that an individual with the highest internal exposure to radiation as a result of discharge of liquid radioactive waste in the United Kingdom (an individual who eats large quantities of fish caught in the Windscale area) is receiving a radiation dose which is equivalent to 31 per cent of the limit recommended by the International Commission on Radiological Protection (ICRP). The member of the public with the highest external exposure to radiation is shown to be receiving a dose of about 4.2 per cent of the ICRP recommended limit. Again, this is a particular individual who spends a considerable amount of time working in the inter-tidal area near Windscale. These are extreme cases and the average dose to the public from discharged wastes is considerably lower, representing only a small fraction of the ICRP recommended limit. The Government agrees with the conclusion reached by its predecessors that there is no evidence that such low doses of radioactivity endanger the health of the UK population.

Yours ever,
James



DEPARTMENT OF HEALTH & SOCIAL SECURITY

Alexander Fleming House, Elephant & Castle, London SE1 6BY

Telephone 01-407 5522

From the Secretary of State for Social Services

PO 2715/126

Nick Sanders Esq
10 Downing Street
London SW1

14 January 1980

Dear Nick

I wrote to you on 18 October about the letter from Mr Stan Thorne MP on the reported increase in Leukaemia cases which some people have associated with Windscale.

I now enclose a further draft reply for Mr Thorne. Several MPs have been promised copies of the Prime Minister's reply and I should therefore be very grateful if you could arrange for copies to be sent to the following:-

Den Dover MP
Edward Gardner QC MP
Walter Clegg MP
Peter Blaker MP
Laurie Pavitt MP (via Ministry of Agriculture, Fisheries and Food)
Lewis Carter Jones MP and
Ivan Lawrence MP
Alban Booth, MP

I am copying this to Bill Burroughs (Department of Energy), Ian Fair (Department of Employment), David Edmonds (Department of the Environment) and Garth Waters (MAFF).

B C MERKEL
Private Secretary

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EXTRACT FROM MINUTES OF STANDING SUB-COMMITTEE MEETING ON CANCER HELD ON 12 DECEMBER 1979

REPORT OF THE WORK OF THE STANDING SUB-COMMITTEE ON CANCER

1. LEUKAEMIA IN LANCASHIRE

3.1 The Sub-Committee considered an article by Geary, Benn and Leck which appeared in "The Lancet" in September 1979, claiming that registrations of myeloid leukaemia in Lancashire during 1971-76 were almost twice those reported in 1965-70. It was suggested that this increase was more likely to have been caused by an environmental leukaemogen than improved registration and increased radioactive contamination of coastal waters and fish was mentioned as a possible factor. The article had generated considerable public concern and the Department was co-ordinating action in response. The Sub-Committee also had before them comments on the "Lancet" paper from the Office of Population, Censuses and Surveys, the National Radiological Protection Board and the Medical Research Council and a draft letter for the Prime Minister in reply to Mr Thorne MP was tabled for their views.

3.2 The Sub-Committee agreed that additional statistical data were required on the incidence of other malignancies in the North Western Region and for other regions, and on regional and national incidence of leukaemia by type. Further information about other known leukaemogens was also necessary. Professor Alwyn Smith informed the Sub-Committee that additional statistical analysis of the data showed that the rise in incidence in the area covered by the "Lancet" paper was greater than in Greater Manchester. His department in Manchester was engaged in a number of further studies in consultation with the Leukaemia Research Fund and the National Radiological Protection Board. The Sub-Committee agreed that the draft letter to Mr Thorne MP set out the current situation, insofar as it was known, in broadly accurate terms.

PO/2715/126

Mr Stan Thorne MP

You wrote to me on 4 October concerning a report in "The Lancet" which suggested that the incidence of myeloid leukaemia in Lancashire had increased by almost 50 per cent since 1965. I have asked the responsible Departments to review the available data and to seek the advice of various expert bodies. I am now writing to you to let you know the results of these inquiries.

The Office of Population Censuses and Survey has provided data for all the regions of England and Wales on mortality from leukaemia (not classified by type) and on newly registered cases (from which it is possible to infer incidence). Copies of the data are enclosed. Data before 1968 are not strictly comparable because of a revision of the International Classification of Diseases and full national registration data are not yet available after 1973. It is clear, however, that registration rates generally for leukaemia have increased between 1968 and 1973 and that changes of at least the order reported from Lancashire have taken place in several Regions at different times over the period. For males the rate appears to be increasing in 13 of the 15 regions and for females in 11 of them. All the currently available statistics (including those contained in the article in "The Lancet") are difficult to interpret because the numbers involved are small. To come to any reliable conclusions it would be necessary to have national statistics for each type of leukaemia over a longer period and to correct them to take into account the variations in age structure of the population in each region. Moreover, in the last ten years advances have been made in the methods of identifying and categorising the leukaemias. Consequently doctors are now more likely to be able to make a primary diagnosis before the condition proves fatal and this will be reflected in the number of registered cases of specific forms of leukaemia and in the numbers of deaths attributed to them.

The article in "The Lancet" suggests that the upward trend in the registration of leukaemia in Lancashire may be related to increases in environmental leukaemogens. In particular it mentions rises in radioactivity in the coastal waters, fish and molluscs in the north Irish Sea as monitored and reported by the Fisheries Radiation Laboratory of the Ministry of Agriculture, Fisheries and Food. It is over the past 20 years but even at the highest they could not have given rise indeed true that these levels of radioactivity have risen/to radiation doses sufficient to account for the reported increases in the incidence of leukaemia.

The Medical Research Council advises me that observations of leukaemia among atom bomb survivors and patients who have undergone radiotherapeutic and radiodiagnostic exposure to radiation have led the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) to estimate that the risk of inducing leukaemia by radiation is about 20 cases per million people exposed to an average dose of one rem to those organs which form blood (principally bone marrow). The mean interval between exposure and diagnosis of the disease is estimated to be about 10 years. Therefore, for radiation to have been responsible for the reported increase of 20 cases per million per year between 1971 and 1976 (as compared with 1965 to 1970) each member of the population of Lancashire would have had to have been exposed to about one rem more in each of the years between 1961 and 1966 than they were in the previous five years. There is no evidence that the people of Lancashire have ever received more than a minute fraction of this dose rate to the relevant tissues of the body.

The amounts and the means of disposal of radioactive waste from nuclear installations have to be specifically authorised by the Department of the Environment and the Ministry of Agriculture, Fisheries and Food under the Radioactive Substances Act 1960 and compliance with the authorisation is monitored. Authorisations are framed to ensure that any radiation exposure to the public as a result of the discharge is a small fraction of the dose limit recommended by the International Commission on Radiological Protection. These ICRP recommendations take into account the views of UNSCEAR on the data available and the consequences likely to arise from increased radiation in the environment.

In view of the concern expressed by you and other Hon Members over the article in "The Lancet", I am pleased to learn that the Leukaemia Research Fund and the Cancer Research Campaign are interested in undertaking further studies in co-operation with the Department of Health and Social Security and the Medical Research Council. These could include some major epidemiological studies of childhood cancer, including leukaemia, in the Midlands and northern England and some prospective studies in childhood and adult leukaemia in other parts of the country. The MRC's Protection against Ionising Radiation Committee and the National Radiological Protection Board are also being asked to keep the subject under review.

MALES

	United Kingdom	Scotland	Northern Ireland	Wales	England	Newcastle	Leeds	Sheffield	East Anglian	North West Metropolitan	North East Metropolitan	South East Metropolitan	South West Metropolitan	Wessex	Oxford	South Western	Birmingham	Manchester	Liverpool
1969	1776	53	60	97	1566	105	133	147	44	143	122	124	143	70	55	108	168	133	61
1970	1737	61	48	81	1547	113	103	175	47	138	115	133	115	77	77	97	152	138	67
1971	1741	48	51	90	1552	95	101	165	64	149	101	126	113	67	57	115	183	154	62
1972	1744	66	44	89	1535	124	90	114	69	155	91	130	124	66	71	121	167	150	65
1973	1820	55	58	91	1602	117	104	148	49	167	115	146	106	81	61	117	170	146	75

FEMALES

1969	1479	52	39	71	1317	71	95	118	33	143	89	116	107	52	62	91	147	137	56
1970	1450	51	43	62	1294	69	99	107	54	139	91	122	115	54	46	82	121	119	76
1971	1467	56	34	82	1295	83	93	114	46	138	89	137	100	58	43	89	125	118	62
1972	1590	61	39	72	1410	96	88	136	46	134	95	104	115	67	60	116	156	126	71
1973	1430	52	40	64	1266	80	98	116	49	109	95	101	114	47	41	81	149	125	61

	United Kingdom	Scotland	Northern Ireland	Wales	England	Northern	Yorkshire	Trent	East Anglian	North West Thames	North East Thames	South East Thames	South West Thames	Wessex	Oxford	South Western	West Midlands	North Western	Hessey
<u>MALES</u>																			
1974	1766	51	49	86	1566	81	116	158	68	114	134	114	110	97	73	127	174	123	77
1975	1881	74	54	94	1642	82	123	162	67	122	135	144	131	99	60	121	159	141	96
1976	1839	87	45	106	1590	81	117	142	59	135	106	155	115	102	70	123	181	122	82
1977	1863	94	58	86	1605	88	118	160	62	121	122	133	104	94	70	139	170	131	93
<u>FEMALES</u>																			
1974	1545	85	25	73	1356	87	99	117	57	101	114	114	84	67	54	105	138	133	86
1975	1550	67	42	77	1352	67	93	133	44	101	110	113	102	67	54	107	142	137	82
1976	1589	81	23	81	1395	81	105	112	48	112	120	151	97	68	54	90	135	137	85
1977	1610	82	40	98	1377	71	103	138	52	104	119	127	116	72	70	99	136	110	60

* English Regions for 1969-1973 = Regional Hospital Boards
1974-1977 = Regional Health Authorities

Death Rates per million population for Leukaemia, 1969 to 1977

Regions

MALES																				
	United Kingdom	Scotland	Northern Ireland	Wales	England	Newcastle	Leeds	Sheffield	East Anglian	North West Metropolitan	North East Metropolitan	South East Metropolitan	South West Metropolitan	Wessex	Oxford	South Western	Birmingham	Manchester	Liverpool	
1969	66	21	81	73	70	69	85	64	51	71	76	76	91	73	57	72	66	63	46	
1970	65	24	64	61	69	74	66	76	54	66	71	81	73	79	79	64	59	63	61	
1971	64	19	68	68	69	64	65	72	73	72	63	77	72	68	57	75	72	70	58	
1972	64	26	58	60	68	83	57	49	78	75	57	79	79	66	70	78	66	68	59	
1973	67	22	76	68	71	79	66	64	54	81	72	89	68	80	60	75	67	66	70	
FEMALES																				
1969	52	19	50	51	56	45	57	50	38	65	53	64	61	50	64	56	57	58	48	
1970	51	19	55	44	54	44	60	46	61	63	54	67	65	51	47	50	46	50	65	
1971	51	21	44	59	55	52	56	48	51	63	53	76	58	55	43	54	48	50	54	
1972	55	23	50	57	59	62	53	57	51	62	56	58	66	62	59	70	60	53	62	
1973	50	19	51	45	53	52	58	49	53	50	56	56	66	43	40	48	57	53	53	
MALES																				
	United Kingdom	Scotland	Northern Ireland	Wales	England	Northern	Yorkshire	Trent	East Anglian	North West Thames	North East Thames	South East Thames	South West Thames	Wessex	Oxford	South Western	West Midlands	North Western	Mersey	
1974	65	20	64	64	69	53	67	71	77	67	74	66	77	74	67	89	68	62	64	
1975	69	30	71	70	73	54	71	73	75	72	75	84	92	75	54	84	62	71	58	
1976	68	35	59	79	70	53	67	64	65	80	59	91	81	77	63	85	71	62	68	
1977	69	38	76	64	71	58	68	72	68	72	68	78	73	71	62	95	67	67	78	
FEMALES																				
1974	54	31	32	51	57	54	54	51	64	56	59	60	54	50	50	69	53	62	66	
1975	54	25	54	54	57	42	51	58	49	56	57	60	66	49	49	70	54	65	64	
1976	55	30	30	57	59	51	57	49	53	62	63	81	63	50	49	58	52	65	66	
1977	56	30	52	69	58	44	56	60	57	58	62	68	75	53	63	64	52	52	47	

Rates per million Population.

Regional Hospital Boards

[illegible]

Mr D W Parris

Ref: A1/R3/15

m 21

Leukaemia in Lancashire

1. I agree with Dr Vennart's view quoted in Mr K Gibson's letter from the M.R.C.
2. In addition you may care to see a letter from Dr G G Schofield, Chief Medical Officer, Windscale, published in the Lancet of 13 Oct. He draws attention to the general increase in leukaemia in the U.K. during the past 30 years, some of which may be due to better diagnosis, general ageing of the population and some to environmental factors. He mentions that there have been 4 cases of myeloid leukaemia which have occurred out of a total of about 600 deaths among the work force employed at Windscale since operations began there in 1951. Dr Schofield told me that the expected figure based on the general population was 3.8.
3. Some further observations have been made in Sweden by Dr L Brandt and his colleagues from the University Hospital, Lund, and published in a letter to the Lancet 17 November 1979 (copy attached). Referring to the publication by Dr Geary and his colleagues, the authors say that data from Sweden are compatible with a real increase in the incidence of acute leukaemia in adults, especially in men over 50. A similar increased incidence is quoted of acute leukaemia in men over 50 which has been reported from Olmsted County, Minnesota. Dr Brandt and his colleagues interpret their data on the basis that several Western countries are probably experiencing a real increase in the incidence of acute leukaemia due to environmental leukaemogenic factors, possibly occupational in origin.
4. Dr Jillian Birch and her colleagues have recently reported (Lancet 20 Oct 1979 p.854; copy attached) a statistically significant increase in acute lymphoid leukaemia in children in the North West Region. The incidence began to rise around 1970 and occurred during the same period as the increase in myeloid leukaemia demonstrated by Geary et al for Lancashire alone.
5. On the other hand Drs Craft and Kernahan (Lancet 17 Nov.1979 p.1069; copy attached) failed to find an increase in acute leukaemia in the Northern Region (which includes Cumbria) in the years 1971-1977. They concluded that if an environmental factor is responsible for the increasing incidence, it does not

seem to be operating in the Northern Region, most of the population of which is almost entirely east of the Pennines.

6. My interpretation of the foregoing is that reported increased registrations of myeloid leukaemia in Lancashire during 1971-76 and of acute lymphoid leukaemia since 1970 in the North West Region are local manifestations of a general upward trend for leukaemia in most regions of England and Wales. There is no evidence of a nationwide increase on a scale similar to that reported for Lancashire. The upward trend may be due to better diagnosis, more efficient registration, ageing of the population or environmental factors. Doses of radiation received by the population as a result of discharges from Windscale (even those eating fish caught locally) are much too small to account for the increase in the registration rates reported.

Norval Taylor

Norval Taylor

7 December 1979

INCIDENCE OF MYELOID LEUKAEMIA IN LANCASHIRE

COLIN G. GEARY R. T. BENN
IAN LECK*Departments of Clinical Haematology and Community Medicine, University of Manchester*

Summary Identification of a "cluster" of cases of acute myeloid leukaemia and chronic myeloproliferative disorders in Lytham St. Annes, Lancashire, prompted an analysis of the incidence of myeloid leukaemias in Lancashire (excluding Ormskirk Health District), as recorded by the Manchester Cancer Registry. Although statistically there was no significant difference in the trend of incidence between the whole former borough of Lytham St. Annes and the other districts studied, the reported incidence of these diseases in the area as a whole had almost doubled, and in two districts nearly trebled, between two consecutive 6 year periods, beginning in 1965. This represents a substantially larger increase than mortality data suggests has occurred nationally in the same period, and is unlikely to be due solely to more accurate diagnosis or reporting.

Introduction

MANY studies of space-time "clustering" of leukaemia and lymphoma have been reported, but the statistical significance of such small groups of patients has been difficult to evaluate. Occasionally, however, the appearance of a cluster may reflect an overall increase in the incidence of a disease over a wider area.¹ In this study, the identification of a cluster of cases of acute and chronic myeloid leukaemia in a single general practice in the Lytham St. Annes area² prompted a formal analysis of the incidence of these diseases in most of Lancashire, based on data collected by the Regional Cancer Registry in Manchester over a 12-year period.

Materials and Methods

The regional cancer registry in Manchester registers malignant neoplasms in residents of the area served by the North Western Regional Health Authority, which includes Lancashire. The notifications of cases to the registry is primarily the responsibility of the staff of the hospitals where treatment is given. Cases not registered at the time are often picked up later, since the registry is notified by the Office of Population Censuses and Surveys of all deaths of residents whose death

certificate record a diagnosis of malignancy; if such a case is not already registered, the hospital concerned will generally notify the malignancy retrospectively after being sent a reminder. The registry was set up in 1962, but registration during its first few years of operation was seriously incomplete, and before the reorganisation of the National Health Service in 1974 its catchment area was that served by the Manchester Regional Hospital Board, which did not cover quite all the country of Lancashire as defined in 1974; the whole of what subsequently became the Ormskirk Health District, and a sparsely populated area now shared between the Blackburn and Burnley Health Districts, were excluded before that date. We have therefore limited our examination of the trend in myeloid leukaemia incidence to 1965 and later, and to Lancashire with the exception of the Ormskirk Health District, while our Blackburn and Burnley data for 1965 to 1973 are based on a slightly smaller population than those for 1974 to 1976.

For each of two periods (1965-70 and 1971-76) and six areas (the former borough of Lytham St. Annes, the remainder of the Blackpool Health District, and the other four health districts of Lancashire to which our data related), the number of registered cases of myeloid leukaemia was determined and converted to a standardised registration ratio—i.e., expressed as a percentage of the "expected" number of registrations (the number that would have occurred in the period and area concerned, given the age and sex distribution of its population, if the incidence of registrations in each age/sex group had been the same for this population as for the two periods and six areas combined).

Results

The analysis revealed a doubling in the standardised registration ratio for myeloid leukaemia in Lancashire as a whole (excluding Ormskirk Health District) between 1965-70 and 1971-76. Lytham St. Annes and the other localities into which Lancashire was divided for this analysis did not differ significantly from one another in the increases observed. The standardised registration ratios for each area and period are given in table 1, together with the observed and expected numbers of cases on which they are based, and the crude registration rates per million per year; the ratios are also shown in figure.

The contributions to the overall increase in myeloid leukaemia rates made respectively by cases registered as acute and chronic and by those whose "acuteness" was not recorded (table 11) show that the trend was common to acute and chronic cases. Figures for the category "leukaemias of miscellaneous or unspecified type" (table 11) show that the apparent increase in myeloid leukaemia did not merely reflect a tendency for cell type to be specified in an increasing proportion of cases. During this time, the hospital laboratory facilities available to general practitioners were essentially unchanged, while in the three hospitals serving the Fylde area, and in Burnley, the same consultant clinical pathologists in charge of haematology services were in post throughout.

Discussion

Our data suggest that the increased incidence of myeloid leukaemia observed in a Lytham general practice² reflected a rising trend in the area as a whole. Whether this was part of a national increase we do not know, since published national registration statistics are not available after 1970. Myeloid leukaemia mortality statistics for England and Wales have been published for the

DR HECKMATT AND OTHERS: REFERENCES—continued

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TABLE I—INCIDENCE OF REGISTERED CASES OF MYELOID LEUKAEMIA BY LOCALITY: LANCASHIRE (EXCLUDING ORMSKIRK HEALTH DISTRICT) 1965–76.

Health district	1965–70			1971–76		
	No. cases registered	Registration rate per million per year	Standardised registration ratio*	No. cases registered	Registration rate per million per year	Standardised registration ratio*
Blackpool						
Former borough of Lytham St. Annes	4	17.2	42.4	13	51.4	123.8
Remainder	43	26.9	76.3	95	49.7	132.9
Blackburn	31	20.0	64.9	49	30.5	99.4
Burnley	22	15.9	50.4	61	43.2	135.3
Lancaster	19	26.3	74.7	37	49.0	131.8
Preston	42	23.9	82.9	75	41.0	141.0
Total (5 districts)	161	22.2	69.0	330	42.5	128.1

* See text for method of calculation.

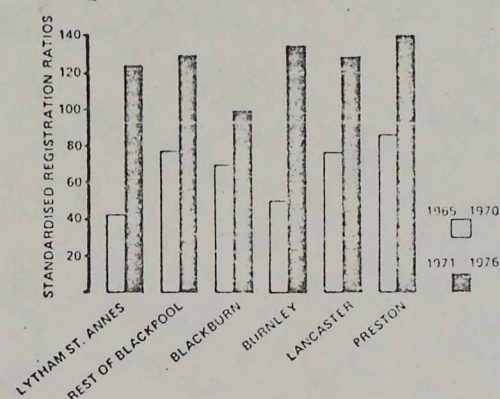
years 1967–76;³ and the rates for 1967–68, and 1971–6 (i.e., the middle years of the earlier period, and the whole of the later period for which Lancashire data are available) are compared in table III. Mortality from acute myeloid leukaemia shows a definite increase; a smaller increment than the rise in registration rates in Lancashire, but nevertheless one that appears too great in relation to the simultaneous decrease in leukaemias of “unspecified or miscellaneous” types to suggest that it is wholly attributable to greater precision in diagnosis. On the other hand, the national mortality from chronic myeloid leukaemia, unlike the incidence in Lancashire, seems hardly to have changed at all.

It may, of course, be suggested that the increases observed in Lancashire are due merely to a more complete ascertainment of cases. Studies of the geographical distribution of leukaemia do not show the wide variations in incidence often found in epithelial cancers: although chronic lymphatic leukaemia is rare in the Far East, acute leukaemia, particularly amongst young adults, shows a remarkable uniformity in incidence

TABLE II—INCIDENCE OF REGISTERED CASES OF MYELOID LEUKAEMIA BY TYPE, AND OF LEUKAEMIAS OF UNSPECIFIED OR MISCELLANEOUS TYPE: LANCASHIRE (EXCLUDING ORMSKIRK HEALTH DISTRICT), 1965–76.

Type of leukaemia	1965–70			1971–76		
	No. cases registered	Registration rate per million per year	Standardised registration ratio*	No. cases registered	Registration rate per million per year	Standardised registration ratio*
Myeloid acute	90	12.4	64.8	202	26.0	131.9
chronic	48	6.6	67.7	101	13.0	129.3
other or not fully specified	23	3.2	97.6	27	3.5	102.1
Unspecified or miscellaneous	45	6.2	92.8	57	7.3	106.5

* See text for method of calculation.



Standardised registration ratios by area and period.

throughout the world. Over the last 50 years, there has been a striking increase in the observed incidence of all types of leukaemia in most Western countries, but this undoubtedly reflects—at least in part—an ageing population, more accurate diagnosis, and the increasing availability of supportive measures, such as antibiotic therapy and blood transfusions, which permit patients with bone-marrow failure to survive until a definite diagnosis is made.⁶ An apparent north-south gradient which was shown in earlier studies of the incidence of leukaemia in the United Kingdom, and which probably reflected higher doctor/population ratios in southern England, had disappeared by the early 1960s.⁶ In some parts of the U.S.A., such as Minnesota, in which high standards of diagnostic accuracy may be assumed, the incidence of leukaemia has been roughly constant for many years.⁷ In other areas, incidence has recently declined.⁸ On the other hand, the reported incidence of myeloid leukaemia in the elderly in Denmark was still rising in the late 1960s,⁹ although this could be an artefact: in recent years more accurate diagnosis of certain patients with oligoblastic (“smouldering”) leukaemia may have led to some of these being registered as cases of acute myeloblastic leukaemia that would formerly have been ascribed to other forms of marrow failure, such as aplasia. Gunz has shown that there exists a strong negative correlation between the leukaemia rates of 25 years ago in various countries, and the subsequent increases notified in each country.¹⁰

It must, therefore, be conceded that more discriminating haematological diagnosis, and more complete registration of cases diagnosed, may account for part of the increase of incidence of myeloid leukaemia we have observed in Lancashire. However, we question whether they are likely to be responsible for the whole of it: our colleagues in the hospitals concerned are not aware of

TABLE III—MORTALITY ATTRIBUTED TO MYELOID LEUKAEMIA AND TO LEUKAEMIAS OF UNSPECIFIED OR MISCELLANEOUS TYPE: ENGLAND AND WALES, 1967–68 AND 1971–76

Type of leukaemia	Deaths per million living per year	
	1967–68	1971–76
Myeloid Acute	15.2	22.1
Chronic	10.2	10.4
Other or not fully specified	1.7	0.8
Unspecified or miscellaneous	8.4	5.6

any abrupt change in the standards of laboratory or clinical investigations available to family doctors in the areas for which they are responsible.

If the increase is real, the possibility that it is due to environmental leukæmogens must be considered. It is likely to be a prerequisite for the recognition of any such agents that their distribution should match that of leukæmia in respect of other variables as well as secular time.⁹ Leukæmic clusters have been reported occasionally as a result of industrial exposure.¹¹ We have been unable to identify any chemical leukæmogen which might be responsible for the increases reported here: on the other hand, recent studies of radioactive contamination of molluscs off the Cumbrian coast, (J. P. Day, unpublished) and government monitoring of radioactivity in coastal waters and fish,¹² show that radiation exposure to the population in this part of North-west England has risen steadily over the past 10 to 15 years. The observation that cytogenetic analysis may be helpful in identifying cases of acute myeloid leukæmia induced by chemical agents could prove to be a useful tool in determining the importance of certain exogenous leukæmogens in the aetiology of the disease.¹³

No isolated epidemiological study of this kind can be conclusive, but as Doll^{3,4} has pointed out, while better diagnosis and other technical factors must have contributed to the rising mortality ascribed to leukæmia, similar effects used to be invoked to support the belief that the apparent increase in mortality from lung cancer was spurious, which few would accept today. The rate of increase in leukæmia mortality in the elderly over the past 20 years has roughly paralleled the corresponding increase in lung-cancer mortality, and the possibility remains that a proportion of cases are due to leukæmogens, whether extrinsic or intrinsic, or perhaps acting in combination, in susceptible individuals.

We are grateful to Dr J. Rusius (General Hospital Burnley), Dr D. S. Harry (Victoria Hospital, Blackpool), Dr A. F. Ollerenshaw (Royal Infirmary, Preston), and Dr G. Birchall (Royal Lancaster Infirmary) for furnishing details about hæmatological facilities available to family doctors in their respective areas. We also thank Mrs Jean Lamont and her staff in the coding office of the Regional Cancer Registry for help in analysing the registry's data.

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CLONIDINE IN TOURETTE'S SYNDROME

D. J. COHEN
J. A. NATHANSON

J. G. YOUNG
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Child Study Center and the Departments of Pediatrics, Psychiatry, and Neurology, Yale University School of Medicine, New Haven, CT 06510, U.S.A.

Summary Tourette's syndrome (TS) is a neuropsychiatric disorder characterised by changing motor and phonic tics, compulsive actions, and other behavioural symptoms. Small doses of clonidine, an α -adrenergic agonist, improves the condition in some children unresponsive to haloperidol. Clonidine presumably acts by inhibiting central noradrenergic function. Metabolic and clinical findings suggest the involvement of monoamines, including noradrenaline, dopamine, and serotonin, in TS.

Introduction

Gilles de la Tourette's syndrome (TS) arises in childhood and is characterised by multiform involuntary movements and noises and psychological symptoms. Other features of the syndrome include: abnormalities on electroencephalography (EEG) and neurological examination, which suggest a biological aetiology; a familial history of tics, compulsions, and TS, which suggests a genetic contribution; and a higher frequency in males than females (3:1). An almost identical syndrome occurring in different cultures has been reported over the past 100 years or so.¹⁻³

Catecholamine metabolism has been implicated in the pathophysiology of TS.⁴⁻⁶ Haloperidol and phenothiazines inhibit dopaminergic activity and improve the condition; drugs such as amphetamine release catecholamines and exacerbate it. We found reduced turnover of brain dopamine and serotonin; however one child had raised noradrenergic metabolite in the cerebrospinal fluid (CSF).^{4,6,7} Noradrenergic involvement is also suggested by the exacerbation of TS by stress and anxiety.

Clonidine, an imidazoline derivative, is an adrenergic agonist; at low doses, however, it diminishes central noradrenergic activity, apparently by stimulating inhibitory, presynaptic, α -adrenergic autoreceptors on neurons which regulate the locus ceruleus (LC).⁸⁻¹² Clonidine also suppresses noradrenergically mediated symptoms of methadone withdrawal.¹³ Our CSF observations and these studies of the LC and clonidine call for the assessment of noradrenergic metabolism and clonidine in TS.

Method

Clonidine has been given to eight patients (ages 10-16 years) with severe TS in whom haloperidol could not control the condition or produced unacceptable side-effects (depression, rigidity, lethargy, cognitive blunting). Their symptoms appeared between the ages of 4-7 years, and the time between onset of symptoms and clonidine treatment ranged from 4-11 years (mean 6.5). All patients had been treated by many drugs previously, so the likelihood of a lasting "placebo" response seemed slight. All had normal or above average intelligence, and none had evidence of structural central nervous system (CNS) abnormality except for an EEG abnormality in case 2. All had normal blood-pressure.

Patients¹⁻⁵ underwent metabolic, neurological, paediatric, and psychiatric evaluation, routine blood-tests, EEG, com-

CLUSTER OF MYELOID LEUKAEMIA IN LYTHAM ST. ANNES

SIR,—We report here an unusually high incidence of myeloid leukaemia in the area served by a single general practice in Lytham St. Annes, Lancashire.

CASES OF ACUTE (AML) AND CHRONIC (CML) MYELOID LEUKAEMIA IDENTIFIED (CASE NUMBERS REFER TO THE IDENTIFICATION POINTS IN ACCOMPANYING MAP)

Case no	Date of presentation	Sex, age	Diagnosis
1	1972 May	M;48	CML
2	June	F;66	Sub-leukemic AML
3	July	M;64	AML
4	1973 September	F;52	AML
5	1974 September	F;40	Idiopathic thrombocythemia, terminating as AML
6	1975 September	F;70	AML
7	September	F;81	AML
8	1976 January	M;33	AML
9	May	F;73	"Smouldering" AML
10	1977 August	M;38	AML
11	1978 August	F;65	"Smouldering" AML
12	October	M;50	CML

The practice serves approximately 9000 patients and covers an area of some 3 square miles, adjacent to the Ribble Estuary. It maintains a diagnostic register of patients with all types of malignant disease; our interest was first aroused when 3 cases of myeloid leukaemia (2 acute, 1 chronic) were encountered in the first half of 1972. Using the diagnostic register, and the counterfoils of death certificates issued by members of the practice, a search for neoplasms of lymphoid and haemopoietic tissues presenting in 1958-71 was carried out; cases occurring between then and the end of 1978 have been noted as they have arisen. In 1958-71, 1 case of acute myeloid leukaemia, 1 myeloma, 1 "lympho sarcoma", and 2 cases of Hodgkin's disease were noted. In 1972-78, 11 cases of acute and chronic myeloid leukaemia were diagnosed. Details of these cases, all of

which were confirmed by appropriate investigations in hospital, are shown in the table, while their geographical distribution in the practice area is shown in the figure. Between 1972 and 1978 4 cases of non-Hodgkin's lymphoma, 2 Hodgkin's disease, 1 chronic lymphatic leukaemia, and one myeloma were also encountered.

Although increasing diagnostic awareness may be responsible for part of the increased incidence we have observed, it is significant that, whereas there has been a sharp increase in myeloid leukaemia from 1972, the incidence of other types of haemopoietic neoplastic disease, such as myeloma and lymphoma, showed only small increases.

The practice area is continuous with, and overlaps that of, several other physicians working in the area who have not noticed increased numbers of leukaemic patients in their own practices. Nevertheless, it appears that the increased incidence seen by us during the last 7 years reflects a similar increment over a much wider area of Lancashire.

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Lytham St. Annes, Lancashire

Department of Clinical Haematology,
Manchester Royal Infirmary

S. D. REID
T. M. HALL
C. M. B. REID

P. J. HULL

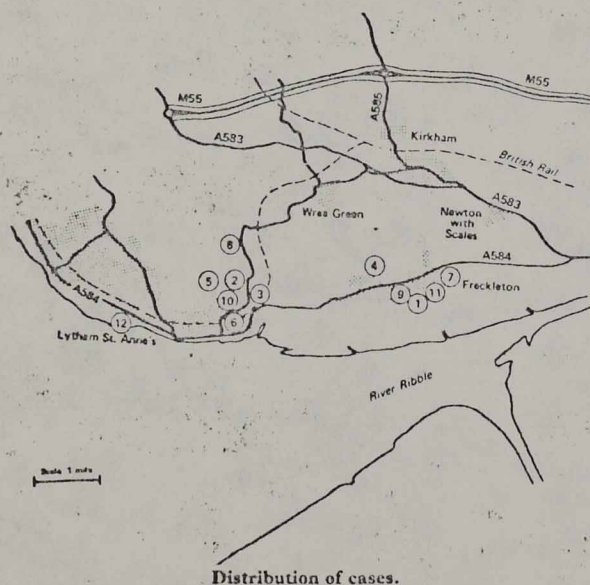
HÆMODIALYSIS WITHOUT HEPARIN IS POSSIBLE

SIR,—Heparinisation of the extracorporeal dialysis circuit has always been thought necessary. Consequently, hæmodialysis carries a risk of hæmorrhage, especially in surgical and severely injured patients. When regional heparinisation¹ was tried a heparin rebound phenomenon caused delayed bleeding.² A second approach to the problem was reduction of the dose of heparin infused into the arterial line.³⁻⁵ Since 1974 we have been trying to do without heparin altogether, monitoring this policy by the frequency percentage of clotting episodes in the extracorporeal circuit.

Between 1973 and 1976, 185 patients with postoperative (133), post-traumatic (24), or medical (28) acute renal failure have been hæmodialysed. During this four-year period, 1049 hæmodialysis sessions were done, with an average of 6 per patient (range 1-29). The mean duration of the sessions was 4.36 ± 1.40 h with an average pump flow of 233 ± 47 ml/min. The apparatus used was an RSP (Travenol) with UF 100, 145, and 11 coils. The dialyser was rinsed with 1000 ml of isotonic saline and primed with 500 ml of modified isotonic gelatin solution ("Plasmion"). During heparin sessions the clotting-time of the blood entering the extracorporeal circuit was measured every 15 min and kept at 15 min. These determinations were used to adjust the rate of heparin administration via an electric syringe. A comparative analysis was done with 92 patients in 529 hæmodialysis sessions with heparin and 93 patients in 520 sessions without heparin. There was no statistical difference in age, sex, or type of renal failure between the two groups. The frequency of clotting episodes in the extracorporeal circuit was 37/529 (6.9%) for the heparin sessions and 50/520 (9.6%) for the non-heparin sessions.

The risk of dialyser clotting during hæmodialysis sessions

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2. Hampers CL, Blautox MD, Merrill JP. Anticoagulation rebound after hemodialysis. *N Engl J Med* 1966; 275: 776-78.
3. Kjellestrand CM, Buselmeier TJ. A simple method for anticoagulation during pre and post-operative hemodialysis, avoiding rebound phenomenon. *Surgery* 1972; 72: 630-33.
4. Lindqvist B, Fritz H, Hagstam KE, Lecerof H, Liljenberg B. Short-clotting-time during hemodialysis by heparinisation with an infusion apparatus. *Acta Med Scand* 1964; 175: 249-50.
5. Bisson PG, Bisson MJ. Reduced heparin dosage for hemodialysis. *Lancet* 1972; ii: 229.



of Craft's patients who undergo elective sterilisation would allow ova to be donated to an infertile couple. Perhaps a similar proportion would donate ova to couples facing a high risk of transmitting a serious genetic disease.

The options open to a woman known to be a carrier of the gene for a serious X-linked disorder such as Duchenne muscular dystrophy are far from ideal. Very few are prepared to take the 1-in-2 risk that a future son will be affected, so in practice they have to choose between no children or further children and selective abortion of all males at about 20 weeks' gestation. Prenatal diagnosis of males affected with Duchenne muscular dystrophy is unreliable, but even where prenatal diagnosis is available (as with haemophilia) the woman still faces the possibility of a late termination of pregnancy. I believe that many such women would find embryo transfer after in-vitro fertilisation of donated ova by her husband's sperm a more acceptable alternative, once these techniques become reliable. This approach would get close to allowing the couple to have "children of their own" without the increased genetic risk. It would also be less dysgenic than selective termination because female carriers would not be produced.

The emotional and ethical problems may be comparable to those relating to artificial insemination by donor (AID), an option adopted by an increasing number of couples facing high genetic risks. AID could be considered in autosomal recessive disorders, and also autosomal dominant conditions on the father's side, whilst ova donation would be helpful in X-linked disorders and autosomal dominant conditions on the mother's side.

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MARCUS PEMBREY

LEUKAEMIA AND RADIATION

SIR,—Dr Geary and his colleagues (Sept. 15, p. 549) reported an increasing incidence of myeloid leukaemia in Lancashire with the occurrence of "clusters". They referred to the possibility that some of the increase may have been due to industrial leukemogens and particular mention was made of the possible role played by radioactive material in the Irish Sea emanating from the Windscale sea discharges.

There is no doubt that there has been a general increase in the incidence of leukaemia throughout the U.K. during the past 30 years. Some of this rise will be due to better diagnosis, some to general ageing of the population, and some to environmental factors. However, I suggest that, for the following reasons, factors other than radiation from Windscale will be found to be the cause.

(1) The liquid effluents from Windscale are discharged to sea under specified conditions provided that the Government authorities are satisfied of the need to discharge and that its environmental impact accords with U.K. policy. These discharges are such that no one exceeds the permitted limit of radiation exposure of 500 mrem/year. Furthermore environmental monitoring shows that members of the public in West Cumbria, except for a few exceptionally heavy fish eaters, do not receive more than about 5 mrem/year as a result of eating fish caught in the Irish Sea. It is to be expected, therefore, that the radiation exposure of the general public in Lancashire will be even less; moreover these figures for population exposure should be viewed in the light of the background radiation to which the whole population is exposed of about 100 mrem/year which may vary by about as much as 40% in different parts of the country.

(2) Some information is available on mortality due to leukaemia in Cumbria and West Cumbria and on the incidence of leukaemia in Cumbria, but there is no evidence from this of an increase comparable to that identified by Geary et al. in Lancashire.

(3) Suppose, however, that the increased incidence in Lancashire were to be due solely to radiation received from fish in

the Irish Sea. This would require an increase by a factor of nearly a thousand in the induction of leukaemia by radiation, compared with the conclusion of the International Commission on Radiological Protection which, over a period of 50 years, has reviewed all the relevant and available data. In such a case effectively all deaths of employees at the Windscale Works would be due to leukaemia but to date there have been 4 cases of myeloid leukaemia out of a total of about 600 deaths which have occurred among employees since operations began at Windscale in 1951.

While it is probable that part of the general increase in leukaemia has been caused by environmental pollutants I would suggest that there is a real need to examine factors other than radiation in the same detail as that which has been accorded to radioactivity.

Windscale & Calder Works,
British Nuclear Fuels Ltd.,
Sellafield, Seascale, Cumbria CA20 1PG

G. G. SCHOFIELD
Company Chief Medical Officer

THE PRESS AND THE H.S.E.

SIR,—It appears from your editorial comment (Oct. 6, p. 29) that the misrepresentations which drew independent protests from Dr J. B. Selkon and myself were due less to distortion by "the media" (*The Lancet* included) than to errors in the statement by the Health and Safety Executive (H.S.E.). That statement was not cleared with those involved who knew the facts. Neither as head of one laboratory concerned nor as a member of the Dangerous Pathogens Advisory Group have I received the courtesy or the formality of a sight of the statement before or after publication. To those H.S.E. colleagues with whom I have worked and for whom I have no regard I extend sympathy at finding their important organisation so weakened in credibility by this mistake. My confidence in *The Lancet* is restored.

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N. R. GRANT

BLINDNESS AND MALIGNANT HYPERTENSION

SIR,—Dr Hulse and colleagues (Sept. 15, p. 553) describe blindness in three children with malignant hypertension. We have recently seen a 15-year-old boy with sudden onset of blindness during treatment of malignant hypertension.

In 1975, at the age of 10, he was found, on investigation of a poor stream by microradiography, to have a dilated prostatic urethra and severe bilateral aortic reflux, probably secondary to posterior urethral valves. Transurethral resection of some of the mucosal folds of the posterior urethra was done. In January, 1978, in view of persistent aortic reflux re-implantation of his ureters was done. Postoperative blood-pressure (none previously being recorded) was 170/100 mm Hg.

He was admitted to hospital 7 a.m. on April 15, 1979, with a 10-day history of purpura and a 3-day history of headache and vomiting. On the day before admission he had complained of blurred vision. On admission he had multiple retinal haemorrhages over his chest, forearms and legs. His blood-pressure was 240/150 mm Hg and fundal examination revealed changes of malignant hypertension, with bilateral papilloedema, extensive retinal haemorrhages, and focal retinal infarcts. Visual acuity was limited to an ability to count fingers at a distance of half a metre. Urinalysis showed proteinuria + + +. At midnight he was given diazoxide 150 mg intravenously and his blood-pressure fell from 240/150 to 170/110. He was put on propranolol 20 mg 6 hourly, and received a further dose of diazoxide (150 mg i.v.) at 10.15 a.m. on April 16 (when his blood-pressure was 180/150) with a resultant

WINDSCALE NOT RESPONSIBLE FOR LEUKAEMIA INCREASE

Factors other than radiation from Windscale are likely to be the cause of increased incidence of leukaemia in Lancashire according to the Chief Medical Officer of British Nuclear Fuels Limited, Dr Geoffrey Schofield.

In a letter[†] published in this week's edition of the medical magazine, The Lancet, Dr Schofield says there has been a general increase in leukaemia throughout Britain over the past 30 years. Some of this rise is due to the general ageing of the population, some to better diagnosis and some to environmental factors.

In a recent article in The Lancet* a team from Manchester University reported a doubling in myeloid leukaemia cases in Lancashire between two consecutive six-year periods beginning in 1965. They said this represented a substantially greater increase than in Britain as a whole over the same period.

Dr Schofield lists a number of reasons why he considers it unlikely that the leukaemia rate in Lancashire can be linked with radioactivity in the Irish Sea resulting from Windscale.

Radioactive discharges from the plant are maintained within limits set by Government authorising authorities and no member of the public has exceeded the permitted radiation exposure of 500 millirems in any one year.

In fact even in West Cumbria, close to Windscale, typical members of the public receive no more than 5 millirems per year radiation exposure from locally caught fish. The radiation exposure for the public in Lancashire would be even less. Yet natural background radiation to which the whole population is exposed amounts to about 100 millirems a year, and this figure varies by as much as 40 per cent in different parts of the country.

m/f

If all the quoted increase in leukaemia in Lancashire were solely due to radiation received from fish caught in the Irish Sea it would require an increase by a factor of nearly a thousand in the causation of leukaemia by radiation compared with the conclusions of the International Commission on Radiological Protection, which are based on 50 years' study of the relevant data.

If such were the case it could be expected that effectively all the deaths of Windscale workers would be from leukaemia. In fact there have been four cases of myeloid leukaemia out of a total of about 600 deaths among employees since the start of operations at Windscale in 1951.

Despite the proximity of Windscale there is no evidence of any increase in the incidence of leukaemia in Cumbria comparable to that reported in Lancashire.

"While it is probable that part of the general increase in leukaemia has been caused by environmental pollutants, I would suggest that there is a real need to examine factors other than radiation in the same detail as that which has been accorded to radioactivity," said Dr Schofield.

Footnote: Mr Peter Mummery, BNFL's Director of Health and Safety, estimates that the radiation exposure a typical Cumbrian would receive in a year eating fish from the Irish Sea is no more than that received from cosmic radiation in making one jet flight across the Atlantic.

ENDS

"Incidence of myeloid leukaemia in Lancashire" by Colin G Geary, R T Benn and Ian Leck (Departments of Clinical Haematology and Community Medicine, University of Manchester): The Lancet, 15 September 1979.

+A copy of Dr Schofield's letter is attached

DR WRIGHTON

Ms Ellison

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LEUKAEMIA IN LANCASHIRE

You asked for my comments on the letters from OPCS, MRC and NRPB on this subject.

The comments from Dr Vennant of the MRC Radiobiology Unit are particularly helpful and could form the basis for the bulk of your draft reply. Dr McLean points out that the increase in leukaemia deaths is a national phenomenon and mentions one or two possible causes for this. More efficient registration cannot be a significant factor in the recorded increase in deaths as these are derived from death certificates. More accurate diagnosis, on the other hand, is probably a factor but it is very difficult to judge how much that might contribute to the rise in deaths attributed to leukaemia. The haematological diagnosis of leukaemia can be very difficult because of the diversity of the blood picture in the early stages of the disease. Improvements in the classification of the leukaemias and in the diagnostic criteria have improved the accuracy of diagnosis but a more significant factor may be that acute cases are now kept alive long enough for a definitive diagnosis to be made whereas formerly, and upto quite recently, patients with acute leukaemia often died very quickly of haemorrhage or intercurrent infection without the underlying cause being recognised.

The remaining possibility for the increase in deaths is an increase in the occurrence of or increased susceptibility to some causative agent or agents. We have no evidence whatever on this and Dr Vennant's letter to my mind pretty effectively disposes of ionising radiation as the cause, at least in this case.

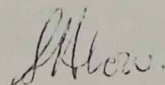
The paper by Geary et al is based on registrations; they do not give mortality figures for the period and area under consideration. Mortality figures for the NW Region do not show any greater change than the country as a whole. National registration figures upto 1973 also appear to show no greater change in the NW Region than elsewhere. There are however difficulties in comparing these figures as the OPCS figures refer to leukaemia as a whole whereas the Lancashire figures refer only to myeloid leukaemia and chronic myeloproliferative disorders. One would need to look at the national figures for these diagnostic categories in order to make a proper comparison.

For the purposes of the draft letter for SSCC I think it would be useful to plot out the national and NW Region figures for mortality and incidence for leukaemia as provided by OPCS. I will try to lay my hands on more detailed breakdown figures for the various types of leukaemia. I do not think it would be particularly relevant to compare the leukaemia figures with those for cancer generally as the nature of the conditions is really rather different.

You may like to know that I have had a long discussion with the Leukaemia Research Fund about the Lancashire problem. They are anxious to try to do some detailed epidemiological studies and will be talking to Alwyn Smith in a week or two about what might be done in Lancashire (I have also been in

touch with Alwyn Smith but have not yet had a reply). LRF and CRC will be funding jointly a major epidemiological study of childhood cancer in W Midland, Yorkshire and N Western, probably beginning next year, which will cover childhood leukaemia and they are also talking to various people about prospective studies on childhood and adult leukaemia in Bristol, Edinburgh, Nottingham and S Wales. They are clearly prepared to put quite a bit of money into this and are anxious for close collaboration with DHSS and MRC LRF are happy for us to refer to this in the draft letter if you feel it is appropriate.

pp



R J WRIGHTON
Med SM4

6 December 1979

cc Dr Oliver

reference A203/59

22 November 1979

Dear Mr Harlow,

You recently asked for advice on a recent publication of an article in "The Lancet" on the incidence of myeloid leukaemia in Lancashire. I have now received some comments on the subject from Dr J Vennart the Chairman of Council's Protection Against Ionising Radiation Committee (PIRC).

Dr Vennart writes:

"Geary, Benn and Leck (Lancet, 15 September, 1979) report that registrations of myeloid leukaemia in about one and a quarter million people in Lancashire during 1971-76 were about twice those in 1965-70. Registrations in the latter period were about 20 cases per year per million of the population more than in the previous 6 years. The authors were unable to identify any chemical leukaemogen that might be responsible for the increase but referred to increases in the radioactivity of coastal waters and fish off North West England during the last 10-15 years, implying that this might be the cause of the increased registrations.

The data supplied by the authors for registrations in the two consecutive 6 year periods are not sufficient to establish the actual change in rate of registrations nor to establish whether or not this is different from that observed in the rest of the country. However, even if the trend were real, it can be shown it is very unlikely that any part of the suggested doubling of registrations was the result of increases in discharges of radioactive waste to the local environment.

From observations of leukaemia in atom bomb survivors and in patients who had undergone radiotherapeutic and radiodiagnostic procedures, the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR, 1977) estimates that the risk of inducing leukaemia by radiation is about 20 cases per million people each receiving an average dose of 1 rem (0.01 sievert) to their blood forming organs, principally the bone marrow. The mean interval between exposure and diagnosis of the disease is estimated to be about 10 years, with most of the cases occurring between 5 and 15 years after the exposure. Therefore, for radiation to have been responsible for the reported increase of 20 cases per million per year in 1971-76, the population of Lancashire would have had to be exposed to about 1 rem (0.01 sievert) more each year during 1960-70 than they had received in previous years. Doses received after 1970 would have been much less effective. There is no evidence that the people of Lancashire have ever received more than a minute fraction of this dose rate to the relevant tissues of the body, still less that exposure increased by the required amount during the relevant period as a result of discharges of radioactive waste to the Irish Sea.

.....

Levels of radioactivity in the aquatic environment are reported regularly by the Ministry of Agriculture's Fisheries Radiobiological Laboratory, they were the subject of scrutiny at the Windscale Inquiry (1977) and, together with other sources of radiation to which the public is exposed, have been reviewed recently by the National Radiological Protection Board (NRPB R-77, 1978).

Before 1972 the greatest doses received by people from discharges of radioactive waste to the Irish Sea arose from the ingestion of radioactive ruthenium in sea-weed eaten as laver bread by a very small group, mainly in South Wales. The organ of the body most heavily irradiated was the intestine. Irradiation of the intestine is not considered to be leukaemogenic and the dose to other tissues of the body will have been very small. This source of radiation can hardly have made significant contribution to any increase of leukaemia in Lancashire.

By far the most relevant source of radiation in relation to the possible induction of leukaemia by radioactivity discharged to the Irish Sea, arises from eating fish and shell fish contaminated with radiocaesium and to a much lesser extent americium. Doses to the whole body from this source have been increasing, especially since 1974 when corrosion of fuel rod cladding increased the contamination of water in the storage ponds at Windscale. The greatest annual dose received by anyone in the small group of people eating fish caught locally near Windscale is estimated to be about 250 millirem (250 thousandths of 1 rem or 2.5 millisieverts) during 1976. The mean for this small group of people was estimated to be about 100 millirem and the contribution to the UK population dose, on average about 0.2 millirem per person. Doses of this magnitude, even if maintained each year, are much too small to account for an increase in the registration rate of leukaemia reported in Lancet. Moreover, doses received after 1970 would have been much less effective than those received earlier in producing an increase in leukaemia during the relevant period 1971-76, as discussed above. Doses from eating contaminated fish were indeed rising during the relevant period 1960-70 but even the values for 1970 were less than one-tenth of those already mentioned for 1976. It is most unlikely therefore that they contributed on average as much as 1 millirem each year to the doses received by the population of Lancashire during the years 1960-70. This is one-thousand times less than the increase in annual dose required to raise leukaemia incidence by the 20 per million per year reported in the Lancet article. Put another way, it is most unlikely that any case of leukaemia registered in the population of Lancashire has been the result of discharges of radioactive waste to the Irish Sea.

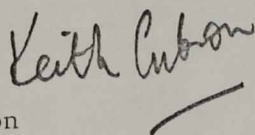
Of course it could be claimed that this result is only to be expected. Discharges of radioactive materials to the environment are controlled by Government Regulations that are based on recommendations of the International Commission on Radiological Protection which in turn reflect the views expressed by UNSCEAR about the risks of ionising radiations, especially at the low dose rates considered here and also

.....

in relation to people exposed occupationally. But it is inconceivable that the UNSCEAR estimate of the risk of radiation induced leukaemia is at least one-thousand times too small. Even if it were in error by less than a factor 10 this would have become evident already from current studies of people who have been exposed at work."

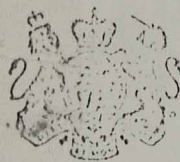
The PIRC will be asked at their next meeting to keep the matter under review. I hope the above comments are helpful; please do not hesitate to contact me if you would like any further information.

Yours sincerely

A handwritten signature in dark ink, appearing to read 'Keith Gibson'. The signature is written in a cursive style with a horizontal line underneath the name.

K Gibson

Mr M A B Harlow
Department of Health
and Social Security
Hannibal House
Elephant and Castle
London SE1 6TE



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DEPARTMENT OF HEALTH & SOCIAL SECURITY
Alexander Fleming House, Elephant & Castle, London SE1 6BY

Telephone 01-407 5522

From the Minister of State (Health)

PO(MIN-H)2487/1

Roger Stott Esq MP

21W November 1979

Dear Roger

I am now able to send you a full reply to your letter of 24 October, enclosing one (attached) from your constituent Mr John Williamson of 9 Yewdale, Shevington, Wigan concerning a report in the Guardian of a study from Manchester University which suggests that there has been an increase in the incidence of leukaemia in Lancashire.

Mr Williamson asked why national statistics for leukaemia incidence have not been published since 1970. In fact, national statistics for 1971 are available and those for 1972 and 1973 are currently being printed and will be published shortly. The Cancer Registration Scheme is a voluntary scheme and the work associated with it must be considered against other local priorities. Consequently, there are sometimes unavoidable delays in information being received by the Office of Population Censuses and Surveys which cannot begin national tabulations until all the Regional data is available.

Mr Williamson also asked whether leukaemia incidence will be published in future in a form which permits area by area analysis. Statistics are currently collected for each Regional Health Authority and the Office of Population Censuses and Surveys have advised that, because of the relatively small numbers involved, to go below this level would raise problems of confidentiality and statistical significance.

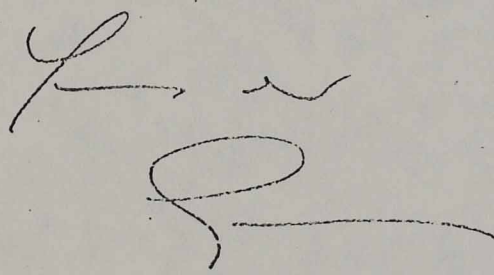
Your constituent's third question concerned the publication of information about the release of radioactive waste into the coastal waters and estuaries of the North West. Information has been published for the 1950s by the old Atomic Energy Authority, and for the 1960s by the Ministry of Agriculture, Fisheries and Food's Fisheries Radiobiological Laboratory at Lowestoft. The Ministry of Agriculture, Fisheries and Food inform me that the Laboratory first became involved in systematic monitoring in 1958/9, and their first technical report was published in 1967, summarising information arising from the monitoring programme for 1966, and presenting data for the years 1963-5 where

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is was available in an appropriate form for comparison. Results prior to 1963 are available, but were not published in a systematic form and comparison may be misleading. When examining results it is important to bear in mind that both monitoring and evaluation techniques have progressed considerably since the publication of the earliest reports. If Mr Williamson would like copies of the ERL reports, he should write to the Fisheries Radiobiological Laboratory, Hamilton Dock, Lowestoft.

Lastly, Mr Williamson wanted to know whether there has been a direct release of radioactive waste into the Ribble. The Department of the Environment have informed me that they have authorised British Nuclear Fuels Limited, under the Radioactive Substances Act 1960, to discharge liquid low-level radioactive waste (principally uranium from fuel production) into the tidal waters of the Ribble from their Springfield Works at Salwick, near Preston. Both the amount (maximum quarterly activity limits) and the means of disposal (through a specially constructed pipeline) are specifically laid down in the certificate of authorisation to ensure more than adequate dilution and dispersal at the point of discharge. Compliance with the terms of the authorisation is monitored by a Radiochemical Inspector from the Department of the Environment by means of periodic visits to the Works and examination of records of discharge sample analysis carried out by the Company.

I should like to add that I am aware that the report in "The Lancet" which gave rise to the Guardian article has caused considerable concern. This Department is, therefore, co-ordinating a review of all the available data in order to discover how the incidence of leukaemia in Lancashire compares with that for other regions and with national figures and to try to establish whether there is a connection between radiation levels of the order of those encountered in the West Lancashire area and the incidence of leukaemia. The advice of the National Radiological Protection Board and the Medical Research Council is being sought.



DR GERARD VAUGHAN



Telephone
01-242 0262

Mr M A B Harlow
DHSS
Hannibal House
Elephant and Castle
London
SE1 6TE

Office of Population Censuses and Surveys
Medical Statistics Division
St Catherine's House 10 Kingsway
London WC2B 6JP

Your ref PO/2715/126

Our ref SD 56/2/9

14 November 1979

Dear Mr Harlow

Estimates of ascertainment within regional or national cancer registries are complex and we do not have many numerical estimates. However, to our knowledge the cancer registry in Manchester for ^{which} Professor Leck has been responsible is one of the few where estimates of completeness is of the order of 90% and we believe that this is as good as any and better than most of the regional cancer registries. We do not have specific information about completeness of registrations as far back as 1965, but suspect that the standard of registration has been consistently good throughout that time. As you will have seen from cancer mortality and registration which has already been sent to you there is no evidence of a nationwide increase of the magnitude reported in the paper in the Lancet.

Yours sincerely

PP A M Adelstein MD FRCP
Chief Medical Statistician

Tuesday 13 November 1979
Written Answer

PQ 1444/1979/80
Han Ref Vol
Col

LEUKAEMIA - DEATH RATE

W29 Mr Lewis Carter-Jones (La. Eccles)

To ask the Secretary of State for Social Services, if he will list the morbidity and mortality rates from leukaemia in each of the past five years for the United Kingdom, England, Wales, Scotland, Northern Ireland and each English region, respectively.

SIR GEORGE YOUNG

In view of the size of the tabulations requested by the Hon Member I am placing them in the library, and sending the hon Member a copy direct.

National Radiological Protection Board

Chairman: Sir Frederick Dainton FRS

Director: Dr A S McLean CBE Secretary: L D G Richings

Harwell Didcot
Oxfordshire OX11 0RQ

Telephone Abingdon (0235) 831600
Telex 837124

B.555 (Folio 40)

12th November 1979

Mr. M.A.B. Harlow,
Department of Health and Social Security,
Hannibal House,
Elephant and Castle,
London SE1 6TE

Dear Mr. Harlow,

Incidence of leukaemia in Lancashire

You wrote to the Board on the 25th October about the article in Lancet of September 15th and Mr. Stan Thorn's letter to the Prime Minister.

We have studied the tables that were attached to your letter and it seems that the increasing registration rates for leukaemia between 1968 and 1973 are more or less country-wide and not local. For males the rate is increasing in 13 of the 15 regions and for females in 11 of them. The average rate of increase for all 15 regions in males is by 5.4 per cent/year and for England and Wales 4.9 per cent. For females the figures are 3.9 per cent and 3.5 per cent respectively. These are for totals of all four types of leukaemia and are not (or not stated to be) age corrected; at least the trend seems to be rather general, whether due to change in mean age, more efficient diagnosis, more efficient registration or some causative agent. I note that you have been in touch with the Office of Population Censuses and Surveys and also with the Medical Research Council. For your information, you should know that we, too, are in touch with Dr. Adelstein of OPCS and also with Professor Allwyn Smith at Manchester with a view to clarifying what is being done to answer the questions raised by the Lancet article. We have little information about the environmental levels of radiation in Lancashire or, indeed, about any other possible carcinogen but it may be that local and central environmental departments will be able to comment on this aspect.

Yours sincerely,

Andrew McLean

A.S. McLean

Tuesday 6 November 1979
Written Answer
Monday 19 November 1979

PQ 1872/1979/80
Han Ref Vol
Col

NUMBER OF PEOPLE WHO HAVE DIED FROM CANCER IN BIRMINGHAM
SINCE 1954

80 Mr Ivan Lawrence (C. Burton)

To ask the Secretary of State for Social Services, how many people have died of cancer in Birmingham in every year since 1954 to date, breaking the figures down into particular cancer sites.

SIR GEORGE YOUNG, Pursuant to his reply OFFICIAL REPORT 12 November 1979
Vol 973 C 433 7, gave the following information: the figures are as follows:

TABLE ATTACHED

DEATHS FROM CANCER IN BIRMINGHAM CB, 1954-77

		All malignant neoplasms	Buccal cavity and pharynx	Oesophagus	Stomach	Intestine and rectum	Larynx	Lung and bronchus	Breast	Uterus	Prostate	Leukaemia	Other malignant neoplasms including neoplasms of lymphatic and haematopoietic tissue
Males	1954	1,212	45	31	161	207	25	418	5		N/A	23	297
	55	1,252	30	41	195	178	19	411	1		N/A	32	345
	56	1,278	31	27	190	183	16	432	3		N/A	33	363
	57	1,322	18	30	200	200	22	468	2		N/A	40	342
	58	1,265	43	28	192	177	13	468	1		94	22	227
	59	1,270	39	27	176	162	15	494	2		92	28	235
	1960	1,294	22	33	186	145	23	526	1		82	31	245
	61	1,249	26	24	204	144	14	503	2		76	24	232
	62	1,279	24	29	173	178	17	518	1		64	25	250
	63	1,301	24	24	170	145	15	587	2		64	26	244
	64	1,248	22	26	149	131	13	526	3		86	32	260
	65	1,364	24	26	156	152	17	570	1		91	36	291
	66	1,333	20	29	157	167	17	544	5		81	36	282
	67	1,394	23	25	197	158	18	598	3		72	22	278
	68	1,461	30	41	162	176	16	625	-		74	31	306
	69	1,430	25	33	162	153	25	609	3		81	42	297
	1970	1,400	24	51	134	165	16	604	2		74	29	301
	71	1,355	22	37	156	171	18	528	1		75	35	312
	72	1,417	22	34	184	158	13	585	3		85	27	306
	73	1,443	17	47	163	174	17	628	1		67	37	292
	74	1,445	14	34	150	162	14	621	2		87	36	325
	75	1,419	20	47	132	150	14	593	4		94	43	322
	76	1,512	28	52	136	168	27	634	4		89	26	348
	77	1,445	17	43	158	153	11	621	4		91	35	312

Reference

Extract from HANBARD 26 OCTOBER 1979

Sir George Young : This information is not available centrally.

Leukaemia

Mr. Pavitt asked the Secretary of State for Social Services if he will publish in the *Official Report* the mortality and incidence statistics for myeloid leukaemia in London, Birmingham, Liverpool, Manchester, Barrow-in-Furness, Glasgow and Exeter for each year since 1969.

Dr. Vaughan : Available statistics are as follows:

NEWLY DIAGNOSED CASES OF MYELOID LEUKAEMIA
NUMBERS AND RATES PER MILLION POPULATION 1969-77

		North West Metropolitan	North East Metropolitan	South East Metropolitan	South West Metropolitan	Birmingham	Liverpool	Manchester (includes Barrow in Furness)	South Western (includes Exeter)	Glasgow*
NUMBERS										
MALES										
1969	...	60	33	44	48	59	25	60	41	10
1970	...	59	48	55	54	63	25	53	43	6
1971	...	70	49	54	46	102	28	62	54	10
1972	...	88	50	61	61	90	35	71	54	9
1973	...	71	42	53	48	98	43	86	73	8
1974	...				Not available					6
1975	...				Not available					21
1976	...				Not available					22
1977	...				Not available					8
FEMALES										
1969	...	57	30	53	57	69	31	49	27	2
1970	...	67	25	47	45	73	28	45	38	5
1971	...	62	45	50	64	70	37	54	45	4
1972	...	54	40	59	65	81	49	76	63	9
1973	...	68	58	53	50	91	36	92	46	12
1974	...				Not available					12
1975	...				Not available					11
1976	...				Not available					11
1977	...				Not available					17

NEWLY DIAGNOSED CASES OF MYELOID LEUKAEMIA
NUMBERS AND RATES PER MILLION POPULATION 1969-77

		North West Metropolitan	North East Metropolitan	South East Metropolitan	South West Metropolitan	Birmingham	Liverpool	Manchester (includes Barrow in Furness)	South Western (includes Exeter)	Glasgow*
RATES PER MILLION										
MALES										
1969	...	29	21	27	30	23	23	27	27	23
1970	...	28	30	34	34	25	23	24	28	14
1971	...	34	31	33	29	40	26	28	35	24
1972	...	43	31	37	39	35	33	32	35	22
1973	...	34	26	32	31	38	40	39	47	20
1974	...				Not available					11
1975	...				Not available					40
1976	...				Not available					43
1977	...				Not available					116
FEMALES										
1969	...	26	18	29	32	27	27	21	17	4
1970	...	30	15	26	25	28	24	19	23	10
1971	...	28	27	28	37	27	32	23	7	8
1972	...	25	24	33	38	31	43	32	38	20
1973	...	31	34	29	29	35	31	39	27	27
1974	...				Not available					20
1975	...				Not available					19
1976	...				Not available					19
1977	...				Not available					30

Note: Newly diagnosed cases of myeloid leukaemia are not available after 1973 for England and Wales. For earlier years they are only available for Regional Hospital Board areas, not major towns.

* Glasgow County of City 1969-73; Greater Glasgow Health Board Area 1974-77.

DEATHS FROM MYELOID LEUKAEMIA
NUMBERS AND RATES PER MILLION POPULATION 1969-77

							Greater London	Birmingham	Liverpool	Manchester	Barrow in Furness	Exeter	Glasgow
NUMBERS													
Males													
1969	...	...	...	...	...	...	122	17	8	9	—	2	9
1970	...	...	...	...	...	...	113	17	13	4	1	1	9
1971	...	...	...	...	...	...	124	18	11	6	—	2	12
1972	...	...	...	...	...	...	134	13	11	8	1	1	8
1973	...	...	...	...	...	...	147	19	11	11	2	1	10
1974	...	...	...	...	...	...	125	21	11	6	4	3	10
1975	...	...	...	...	...	...	134	22	10	9	2	2	13
1976	...	...	...	...	...	...	122	13	11	4	1	4	17
1977	...	...	...	...	...	...	132	20	12	10	1	4	17
Females													
1969	...	...	...	...	...	...	116	18	8	6	—	2	3
1970	...	...	...	...	...	...	115	18	14	7	—	2	5
1971	...	...	...	...	...	...	141	8	7	2	2	4	10
1972	...	...	...	...	...	...	140	19	9	8	—	5	8
1973	...	...	...	...	...	...	140	24	8	9	1	—	12
1974	...	...	...	...	...	...	119	17	15	7	1	3	12
1975	...	...	...	...	...	...	126	23	16	7	—	2	8
1976	...	...	...	...	...	...	140	19	12	13	—	2	14
1977	...	...	...	...	...	...	141	12	11	4	—	1	17

DEATHS FROM MYELOID LEUKAEMIA
NUMBERS AND RATES PER MILLION POPULATION 1969-77

							Greater London	Birmingham	Liverpool	Manchester	Barrow in Furness	Exeter	Glasgow
RATES													
PER MILLION													
Males													
1969	...	...	...	...	...	...	33	33	26	33	—	45	16
1970	...	...	...	...	...	...	31	34	44	15	32	22	21
1971	...	...	...	...	...	...	35	36	38	23	—	45	28
1972	...	...	...	...	...	...	38	26	39	31	32	22	19
1973	...	...	...	...	...	...	42	38	40	44	64	22	25
1974	...	...	...	...	...	...	36	39	41	24	110	66	19
1975	...	...	...	...	...	...	39	42	38	37	56	44	25
1976	...	...	...	...	...	...	36	25	42	17	28	88	33
1977	...	...	...	...	...	...	40	38	47	42	28	88	34
Females													
1969	...	...	...	...	...	...	29	34	24	21	—	41	6
1970	...	...	...	...	...	...	29	35	43	24	—	40	10
1971	...	...	...	...	...	...	36	16	22	7	61	81	21
1972	...	...	...	...	...	...	37	37	29	29	—	101	18
1973	...	...	...	...	...	...	37	47	27	33	30	—	27
1974	...	...	...	...	...	...	32	31	51	26	26	60	20
1975	...	...	...	...	...	...	34	43	56	27	—	40	14
1976	...	...	...	...	...	...	38	36	42	51	—	40	24
1977	...	...	...	...	...	...	39	23	39	16	—	20	30

Note: The areas are as defined at the time i.e. Birmingham*, Barrow in Furness* and Glasgow* change in 1974. Other areas were not significantly affected by government re-organisation.

* Pre 1974

Birmingham County Borough
Barrow in Furness County Borough
Glasgow County of City

Post 1974

Birmingham Metropolitan District
Barrow in Furness County District
Greater Glasgow Health Board Area

McPavitt
asked UK
S&S

for Social Services if, as part of the sector of work undertaken by the Medical Research Council, he will initiate a new programme of chromosome studies which might be used in identifying the underlying causes of the increased incidence of leukaemia in major towns in Great Britain.

Dr. Vaughan: No. Relatively few types of leukaemia can so far be consistently associated with chromosome abnormalities and the Medical Research Council, the Cancer Research Campaign and the Leukaemia Research Fund are already supporting research programmes in the field of chromosome abnormality in relation to leukaemia. Some of these studies are related to environmental factors and are thus indirectly related to particular places. United Kingdom and European experts are also about to collaborate on a study of the possible relationship between leukaemic states and occupational and environmental factors.

Mr. Pavitt asked the Secretary of State for Social Services why national statistics of leukaemia incidence, as distinct from mortality, have not been published since 1970.

Dr. Vaughan: National statistics for registrations (estimates of incidence) of leukaemia and other cancers have been published for England and Wales for 1971 (OPCS series MB1 No. 1). The publication for 1972-73 is being printed by HMSO at present. National cancer registration statistics are collated from independently collected regional statistics. Regional contributions are not compulsory and are consequently sometimes delayed.

Senile Dementia

Mr. Horder asked the Secretary of State for Social Services how many people in England and Wales suffer from senile dementia; and how many places exist to care for them within the National Health Service and within local authorities.

Sir George Young: Estimates of prevalence suggest that some 700,000 people in England may be suffering from either mild or severe dementia. Provision for their care within the national health service and within local authorities is not separately identified centrally.

National Health Service (Costs)

Mr. Lyell asked the Secretary of State for Social Services whether he will make a statement on the costs of the National Health Service in the light of the report of the Royal Commission; and if he will indicate the amount of extra funds which by reason of any savings will then become available for patient care.

Dr. Vaughan: I assume that my hon. Friend means cost of management. It is the stated aim of this Government to seek reductions over a period in the cost of managing the NHS. They will be pursuing this aim with the health authorities. In addition, the Royal Commission on the NHS has recommended a streamlining of the management structure and a review of the respective roles of unit and functional management. I regard this as a helpful contribution, both to making the management more effective and less costly.

These are some of the issues which will be dealt with in the consultative document, which we will be publishing later in the year. There will be some transitional costs, but I believe that, on the basis of the Royal Commission's recommendations and the Government's drive on efficiency, we should aim to achieve overall savings of about £30 million—that is, 10 per cent. on management costs currently running at around £300 million a year—when all the changes have taken effect. This will enable available resources to be channelled more into direct patient care.

Retinitis Pigmentosa

Mr. Skinner asked the Secretary of State for Social Services if he will set up a monitoring scheme for retinitis pigmentosa patients who have received treatment in Switzerland and the Union of Soviet Socialist Republics.

Dr. Vaughan: Treatments abroad of retinitis pigmentosa are arranged privately and without reference to the Department and such treatment cannot therefore be systematically monitored. Our medical advisers are seeking, where possible and subject to the patients' consent, to obtain reports from the consultant ophthalmologists responsible for such patients in this country under the National Health Service.

NEWLY REGISTERED CASES OF LEUKAEMIA, RATES PER 100,000 POPULATION, BY YEAR AND HOSPITAL REGION OF RESIDENCE																		MALE
Year	ICD	England & Wales	Newcastle	Leeds	Sheffield	East Anglia	NW Metro	NE Metro	SE Metro	SW Metro	Wessex	Oxford	S. Western	Wales	Birmingham	Manchester	Liverpool	
7th Revision																		
1965	204 Leukaemia + aleukaemia	6.1 ✓	5.5	5.1	6.3	6.4	6.4	4.6	7.9	6.5	5.2	7.8	7.8	5.9	5.5	5.3	6.1	
1966	204 Leukaemia + aleukaemia	6.5 ✓	6.4	5.7	6.2	6.5	7.3	5.9	8.0	7.9	5.9	8.1	7.7	5.7	6.0	6.0	4.9	
1967	204 Leukaemia + aleukaemia	6.0	4.9	5.3	6.2	6.4	5.7	4.0	6.8	7.4	6.5	6.9	8.1	5.3	5.9	5.3	6.6	
8th Revision																		
1968	204 Lymphatic leukaemia	2.8	2.8	3.0	3.0	3.0	1.8	1.5	3.2	3.0	2.4	3.5	4.0	3.0	2.8	3.2	2.1	
	205 Myeloid leukaemia	2.6	3.3	3.0	2.4	2.1	2.6	2.2	3.6	2.3	2.4	3.6	2.4	2.0	2.5	2.5	2.1	
	206 Monocytic leukaemia	0.4 ✓	0.3	0.2	0.4	0.5	0.6	0.4	0.2	0.8	0.2	0.2	1.0	0.3	0.4	0.2	0.1	
	207 Other + unspecified	0.8 ✓	0.9	0.8	0.8	0.9	1.0	1.0	1.0	1.1	0.6	0.8	0.4	0.8	0.9	0.7	0.6	
1969	204	3.2 ✓	3.1	2.8	3.3	2.5	3.3	2.9	2.8	4.7	2.5	3.9	4.7	1.8	2.7	3.0	3.2	
	205	2.5	2.8	2.2	1.8	2.9	2.9	2.1	2.7	3.0	2.1	2.5	2.7	2.3	2.3	2.7	2.3	
	206	0.4 ✓	0.7	0.2	0.5	0.1	0.4	0.4	0.4	0.8	0.2	0.3	0.9	0.4	0.4	0.2	0.3	
	207	0.8	0.3	1.2	0.8	0.6	0.7	0.6	1.2	1.1	0.4	0.8	0.9	1.4	1.0	0.7	0.4	
1970	204	2.9	3.3	1.9	2.5	2.2	2.7	2.6	4.0	3.7	2.8	3.1	4.8	1.9	2.8	2.8	2.3	
	205	2.7	3.1	1.7	2.1	1.7	2.8	3.0	3.4	2.4	3.1	3.0	2.8	2.6	2.5	2.4	2.3	
	206	0.4 ✓	0.2	0.2	0.3	0.5	0.4	0.5	0.4	0.9	0.5	0.4	0.8	0.2	0.5	0.4	0.4	
	207	0.9	0.9	1.2	0.7	0.2	0.9	0.7	0.7	1.1	1.2	0.3	0.9	1.3	0.8	1.1	0.5	
1971	204	3.5 ✓	4.3	3.6	3.9	5.0	3.1	2.4	3.2	3.7	2.8	4.1	4.2	3.2	3.3	3.8	2.8	
	205	3.1	2.9	2.4	2.1	3.0	3.4	3.1	3.3	2.9	3.2	4.1	3.5	2.7	4.0	2.8	2.6	
	206	0.3	0.3	0.2	0.3	0.3	0.1	0.1	0.2	0.8	-	0.2	0.5	0.2	0.2	0.1	0.2	
	207	0.8 ✓	0.9	1.2	1.2	0.6	0.6	0.7	1.5	0.8	0.5	0.9	0.3	1.2	0.4	0.8	1.0	
1972	204	3.6 ✓	3.8	3.4	4.6	4.8	4.1	2.3	2.9	4.4	2.4	3.1	5.2	3.8	3.1	3.4	2.6	
	205	3.5	4.5	1.7	3.2	3.7	4.3	3.1	3.7	3.9	2.7	4.9	3.5	3.5	3.5	3.2	3.3	
	206	0.2	0.3	0.1	0.1	0.1	0.2	0.2	0.4	0.3	0.1	0.3	0.3	0.3	0.5	0.1	0.4	
	207	0.7 ✓	1.1	0.8	0.9	0.6	0.7	0.5	0.9	0.6	0.5	0.3	0.6	1.0	0.4	0.9	1.0	
1973	204	3.8	3.6	3.9	3.9	4.0	3.6	3.1	2.6	2.7	5.1	3.7	5.1	4.1	3.8	4.2	3.9	
	205	3.5	3.1	3.2	3.5	3.4	3.4	2.6	3.2	3.1	4.0	3.0	4.7	3.7	3.8	3.9	4.0	
	206	0.3	0.5	0.3	0.3	0.2	0.3	0.1	0.3	0.5	0.2	0.2	0.4	0.3	0.1	0.2	0.2	
	207	0.7	0.9	0.7	1.0	0.1	0.6	0.6	1.0	0.6	1.4	0.4	0.8	1.0	0.3	0.9	0.9	

ICD		England & Wales	Newcastle	Leeds	Sheffield	East Anglia	NW Metro	NE Metro	SE Metro	SW Metro	Wussex	Oxford	S Western	Wales	Birmingham	Manchester	pool
7th Revision																	
965	204 Leukaemia - aleukemia	5.2 ✓	5.0 ✓	3.8 ✓	3.9 ✓	4.5 ✓	6.0 ✓	5.4 ✓	6.8 ✓	7.0 ✓	5.8 ✓	7.1 ✓	5.1 ✓	4.4 ✓	4.8 ✓	4.2 ✓	4.2 ✓
966	204	5.0 ✓	5.3 ✓	4.8 ✓	4.3 ✓	5.7 ✓	5.1 ✓	3.7 ✓	5.9 ✓	6.3 ✓	4.6 ✓	5.0 ✓	7.6 ✓	4.9 ✓	4.4 ✓	4.0 ✓	4.8 ✓
967	204	4.7 ✓	3.6 ✓	5.0 ✓	5.1 ✓	4.9 ✓	5.3 ✓	4.7 ✓	4.5 ✓	4.7 ✓	5.1 ✓	4.1 ✓	6.1 ✓	4.1 ✓	4.7 ✓	4.0 ✓	4.8 ✓
8th Revision																	
968	204 Lymphatic leukaemia	2.1 ✓	2.1 ✓	1.1 ✓	1.9 ✓	2.9 ✓	1.5 ✓	1.4 ✓	2.4 ✓	3.1 ✓	2.3 ✓	3.1 ✓	3.2 ✓	1.1 ✓	2.1 ✓	1.9 ✓	1.7 ✓
	205 Myeloid leukaemia	2.2 ✓	2.8 ✓	2.0 ✓	2.0 ✓	2.0 ✓	2.2 ✓	1.5 ✓	3.1 ✓	2.0 ✓	1.8 ✓	2.1 ✓	2.2 ✓	2.0 ✓	2.3 ✓	1.6 ✓	3.4 ✓
	206 Monocytic leukaemia	0.4	0.2	0.2	0.5	0.5	0.5	0.3	0.2	0.7	0.5	0.6	0.5	0.3	0.4	0.3	0.2
	207 Other + unspecified	0.7	0.4	1.2	0.5	1.4	0.8	0.1	1.1	1.0	0.4	0.6	0.8	0.7	0.8	0.6	0.7
	Total	5.4															
969	204	2.2 ✓	1.9 ✓	2.4 ✓	2.2 ✓	1.8 ✓	1.8 ✓	1.8 ✓	3.0 ✓	3.0 ✓	3.3 ✓	2.8 ✓	2.9 ✓	1.5 ✓	1.6 ✓	2.2 ✓	1.8 ✓
	205	2.3 ✓	2.7 ✓	1.7 ✓	1.6 ✓	2.6 ✓	2.6 ✓	1.8 ✓	2.9 ✓	3.2 ✓	2.2 ✓	3.5 ✓	1.7 ✓	1.6 ✓	2.7 ✓	2.1 ✓	2.7 ✓
	206	0.4 ✓	0.2 ✓	0.1 ✓	0.3 ✓	0.1 ✓	0.7 ✓	0.4 ✓	0.1 ✓	0.8 ✓	0.1 ✓	0.5 ✓	0.7 ✓	0.3 ✓	0.3 ✓	0.3 ✓	0.3 ✓
	207	0.6 ✓	0.1 ✓	0.5 ✓	0.5 ✓	0.6 ✓	0.9 ✓	0.7 ✓	0.9 ✓	0.7 ✓	0.5 ✓	0.7 ✓	0.4 ✓	0.6 ✓	0.9 ✓	0.7 ✓	0.4 ✓
	Total	5.5															
970	204	2.0 ✓	2.0 ✓	1.7 ✓	1.9 ✓	2.1 ✓	1.9 ✓	1.1 ✓	2.9 ✓	2.5 ✓	1.9 ✓	2.2 ✓	2.8 ✓	1.2 ✓	1.8 ✓	2.1 ✓	1.5 ✓
	205	2.2 ✓	2.3 ✓	2.0 ✓	1.5 ✓	2.2 ✓	3.0 ✓	1.5 ✓	2.6 ✓	2.5 ✓	1.4 ✓	1.8 ✓	2.3 ✓	1.8 ✓	2.8 ✓	1.9 ✓	2.4 ✓
	206	0.4 ✓	0.3 ✓	0.4 ✓	0.3 ✓	0.6 ✓	0.5 ✓	0.2 ✓	0.6 ✓	0.3 ✓	0.2 ✓	0.2 ✓	0.8 ✓	0.1 ✓	0.3 ✓	0.1 ✓	0.6 ✓
	207	0.6 ✓	0.4 ✓	1.0 ✓	0.6 ✓	0.8 ✓	0.5 ✓	0.4 ✓	0.5 ✓	1.1 ✓	0.7 ✓	0.3 ✓	0.8 ✓	0.4 ✓	0.7 ✓	0.5 ✓	0.7 ✓
	Total	5.2															
971	204	2.2 ✓	2.5 ✓	2.6 ✓	2.0 ✓	1.7 ✓	2.1 ✓	1.7 ✓	2.5 ✓	2.6 ✓	1.3 ✓	2.9 ✓	2.7 ✓	2.1 ✓	2.3 ✓	2.4 ✓	1.4 ✓
	205	2.7 ✓	2.7 ✓	2.0 ✓	2.1 ✓	3.2 ✓	2.8 ✓	2.7 ✓	2.8 ✓	3.7 ✓	2.0 ✓	3.4 ✓	2.7 ✓	2.5 ✓	2.7 ✓	2.3 ✓	3.2 ✓
	206	0.3 ✓	0.3 ✓	0.2 ✓	0.5 ✓	0.1 ✓	0.4 ✓	0.2 ✓	0.2 ✓	0.3 ✓	0.1 ✓	0.3 ✓	0.1 ✓	0.4 ✓	0.1 ✓	0.3 ✓	0.2 ✓
	207	0.5 ✓	0.4 ✓	0.7 ✓	0.5 ✓	0.1 ✓	0.4 ✓	0.4 ✓	0.7 ✓	0.7 ✓	0.3 ✓	0.2 ✓	0.5 ✓	1.1 ✓	0.5 ✓	0.5 ✓	1.1 ✓
	Total	5.7															
972	204	5.3 ✓	1.7 ✓	1.9 ✓	2.6 ✓	3.9 ✓	1.9 ✓	1.4 ✓	2.3 ✓	2.8 ✓	2.0 ✓	2.9 ✓	2.2 ✓	2.4 ✓	2.7 ✓	2.2 ✓	1.7 ✓
	205	3.0 ✓	3.9 ✓	2.3 ✓	2.7 ✓	2.9 ✓	2.5 ✓	2.4 ✓	3.3 ✓	3.8 ✓	1.1 ✓	3.6 ✓	3.8 ✓	2.3 ✓	3.1 ✓	3.2 ✓	4.3 ✓
	206	0.2 ✓	0.3 ✓	0.3 ✓	0.3 ✓	0.1 ✓	0.3 ✓	0.1 ✓	0.1 ✓	0.4 ✓	0.1 ✓	-	0.2 ✓	0.1 ✓	0.5 ✓	0.3 ✓	0.1 ✓
	207	0.5 ✓	0.6 ✓	0.5 ✓	0.5 ✓	0.3 ✓	0.3 ✓	0.7 ✓	0.5 ✓	0.7 ✓	0.6 ✓	0.6 ✓	1.1 ✓	0.7 ✓	0.2 ✓	0.5 ✓	0.6 ✓
	Total	6.0															
1973	204	2.5 ✓	2.2	2.0	2.2	2.8	2.0	2.1	2.6	2.1	3.0	2.5	3.6	2.8	2.6	2.8	3.5
	205	3.1 ✓	3.5	2.8	2.8	3.3	3.1	3.4	2.9	2.9	2.7	2.2	2.7	3.2	3.5	3.9	3.1
	206	0.2	-	0.2	0.1	0.1	0.0	0.1	0.3	0.4	0.3	0.1	0.2	0.1	0.3	0.3	0.2
	207	0.6 ✓	0.1	0.9	0.8	0.9	0.5	0.2	0.4	0.8	1.2	0.3	0.5	1.2	0.2	0.7	0.9
	Total	6.4															

Radioactivity in Surface and Coastal Waters of the British Isles 1977

G.J. HUNT Lowestoft 1979

(Previous in Fisheries Radiological Laboratory Technical Report FRL series)

9. Summary and conclusions

A summary of estimated public radiation exposures in 1977 resulting from liquid radioactive waste discharges from nuclear establishments monitored by FRL, is presented in Table 32. The exposures are expressed in terms of the dose equivalent to members of the critical group or groups as percentages of the ICRP dose equivalent limit. For each of the exposures given, there is no substantial difference between results estimated on the basis of either ICRP Publication 9 or ICRP Publication 26 recommendations (ICRP, 1966; ICRP, 1977); if there is a difference, the higher value has been quoted.

All exposures were well within the ICRP-recommended limits. Discharges from Windscale have, as in previous years, given rise to the highest exposures. The most important contribution to this exposure was from radiocaesium which originated mainly from the fuel element storage ponds. The

reduction in 1977 to 31%, from the 1976 estimate of 44%, of the ICRP-recommended dose limit to the maximum local fish and shellfish consumer may be explained in terms of changes in dispersion in 1977; discharges of radiocaesium did not decrease. Contributions to exposures near many other nuclear establishments were also caused by radioactivity from Windscale. Since apportionment of exposure to radioactivity of local origin is often difficult, the exposure from all sources (including the small contribution due to fallout) is quoted in Table 32, with an appropriate footnote.

With the exception of Trawsfynydd, exposures near to nuclear establishments besides Windscale which were greater than 1% of the ICRP-recommended dose limit were also caused mainly by Windscale-derived radioactivity. Discharges from Trawsfynydd nuclear power station gave rise to doses to the critical group of fish consumers at a rate of 3% of the ICRP-recommended dose limit.

As in previous years, collective doses from UK liquid radioactive discharges have been considered. The most significant discharges giving rise to collective dose, compared with

which all other discharges may be disregarded, were those from Windscale, radiocaesium being the most significant component. Details were given in section 4.1.1. The collective dose to the UK population in 1977 was 89 man-Sv (8900 man-rem) as compared with 140 man-Sv (14 000 man-rem) in 1976. As before, the decrease was mainly due to different dispersion conditions rather than reductions in discharges.

An estimate is also given of the collective dose (small by comparison with the above) resulting from consumption of tritium in water derived from the River Thames, to whose catchment area discharges are made. In 1977 the estimated 7 million people who depend on this source of water received a total of approximately 1 man-Sv (100 man-rem), corresponding to less than 0.01% of the UK policy limit (Great Britain - Parliament, 1959) (see Section 3.4). The reduction from approximately 2 man-Sv (200 man-rem) for 1976 (Mitchell, 1978) is explained by the increase in mean flow rate of the Thames during 1977 compared with that during the drought conditions in 1976.

10. References

ADAMS, N., HUNT, B.W. and REISSLAND, J.A., 1978. Annual limits of intake of radionuclides for workers. HMSO, London, 42pp. (National Radiological Protection Board, Report NRPB-R82)

BRITISH COMMITTEE ON RADIATION UNITS and MEASUREMENTS, 1978. Draft recommendations on the introduction of the new SI Units for use with radioactivity and ionising radiations. National Physical Laboratory, Teddington, 8pp.

COMMISSION OF THE EUROPEAN COMMUNITIES, 1976. Council directive of 1 June 1976 laying down the revised basic safety standards for the health protection of the general public and workers against the dangers of ionising radiation. Off. J. Eur. Commun., 19 (L 187) 1-2.

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Table 32 Summarised estimates of public radiation exposure from discharges of liquid radioactive waste in the UK, 1977

Establishment	Radiation exposure pathway	Critical group	Exposure ¹ of individual members of critical group, 1977 (% of ICRP-recommended dose limit of 5 mSv y ⁻¹ (0.5 rem y ⁻¹))
BRITISH NUCLEAR FUELS LIMITED			
Windscale and Calder	Fish and shellfish consumption	Local fishing community	31 ²
		Commercial fishing community	13
	External	Occupiers of intertidal areas	4.2 ²
	<i>Porphyra</i> /laverbread consumption	Consumers in South Wales	<0.2
Springfields	External	Dredgers	2 ³
Capenhurst ⁵ (Neols outfall)	Shellfish consumption	Local fishing community	NA
Chapelcross	External		
	Fish and shellfish consumption	Fishermen	<4 ³
UNITED KINGDOM ATOMIC ENERGY AUTHORITY			
Winfrith	Fish and shellfish consumption	Local fishing community	<0.2
Dounreay	External to hands: fishing gear	Local fishermen	<1 ⁴
	External	Winkle pickers	<1 ⁴
NUCLEAR POWER STATIONS OPERATED BY THE ELECTRICITY BOARDS			
Berkeley and Oldbury	Fish and shellfish consumption		
	External	Local fishing community	<0.1 ⁴
Bradwell	Fish consumption	Local fishing community	<0.3 ⁴
Dungeness	Fish consumption		
	External	Local fishing community	<0.1
Bartlepool ⁵	Fish and shellfish consumption	Local fishing community	NA
	External	Coal collectors	
Beysham ⁵	Fish and shellfish consumption		
	External	Local fishing community	NA
Hinkley Point	Fish and shellfish consumption		
	External	Local fishing community	<0.2 ⁴
Hunterston	Fish and shellfish consumption		
	External	Local fishing community	<2 ³
Sizewell	Fish and shellfish consumption		
	External	Local fishing community	<0.2 ⁴
Trawsfynydd	Fish consumption	Local fishing community	3
Wylfa	Fish and shellfish consumption		
	External	Local fishing community	<3 ³
NAVAL ESTABLISHMENTS			
Chatham	External	Houseboat dwellers	<0.1
Devonport	External	Bait diggers	<0.1
Faslane	External	Boatyard workers	<0.1 ⁴
Rosyth	External	Dredgers	<0.1 ⁴
Holy Loch	External	General public	<0.1 ⁴

NA = not applicable.

¹On the basis of the higher of ICRP-9 (1966) or ICRP-26 (1977) procedures (see text).²Based on extreme individual; see relevant section in text.³Mainly due to discharges from Windscale.⁴Partly due to discharges from Windscale.⁵No radioactive discharges made in 1977; potential critical pathways given, but no result for exposure quoted.

Tuesday 23 October 1979
Written Answer
Friday 26 October 1979

PQ 1429/1979/80
Han Ref Vol
Col

LEUKAEMIA RESEARCH

18 Mr Laurie Pavitt (La. Brent South)

To ask the Secretary of State for Social Services, if as part of the sector of work undertaken by the Medical Research Council, he will initiate a new programme of chromosome studies which might be used in identifying the underlying causes of the increased incidence of leukaemia in major towns in Great Britain.

DR GERRARD VAUGHAN

No. Relatively few types of leukaemia can so far be consistently associated with chromosome abnormalities and the Medical Research Council, the Cancer Research Campaign and the Leukaemia Research Fund are already supporting research programmes in the field of chromosome abnormality in relation to leukaemia. Some of these studies are related to environmental factors and are thus indirectly related to particular places. UK and European experts are also about to collaborate on a study of the possible relationship between leukaemic states and occupational and environmental factors.

CF. ~~to~~ note
✓ CF seen.



M. S. THORNE

Thorp
cc DHSS
DN
DM
DOE
MAFF
RCS.

10 DOWNING STREET

THE PRIME MINISTER

22 October 1979

Mr R. Thorne.

Thank you for your letter of 4 October regarding the report in "The Lancet" of 15 September 1979 of an increased incidence of leukaemia in western Lancashire. I have asked the Departments concerned to study the report with care.

It will be necessary to discover how the reported incidence in Lancashire compares with that for other regions and with national figures. The Office of Population Censuses and Surveys is being asked to provide the latest available figures.

Radiation levels in sea water and in fish and molluscs are monitored regularly and the results are published by the Ministry of Agriculture's Fisheries Radiobiological Laboratory. There has been an increase in radiation levels over the past two decades arising in part from atomic fallout, which reached a peak in the mid-1960s, and in part from discharges from nuclear sites.

The important question is whether there is a connection between radiation levels of the order of those encountered in the west Lancashire area and the incidence of leukaemia. The levels of radioactivity which have been recorded in sea water fish and molluscs do not provide a satisfactory explanation by themselves and I am sure that you will appreciate that there are several other possible reasons for the reported increase in the incidence of

/leukaemia.

leukaemia. We are seeking the advice of the National Radiological Protection Board and the Medical Research Council.

As soon as we have got together this further data and advice I will write to you again.

Yours sincerely
Raguel Dehler

S.G. Thorne, Esq., M.P.



DEPARTMENT OF HEALTH & SOCIAL SECURITY

Alexander Fleming House, Elephant & Castle, London SE1 6BY

Telephone 01-407 5522

From the Secretary of State for Social Services

PO 2715/126

Nick Sanders Esq
Private Secretary
10 Downing Street
LONDON SW1

18 October 1979

Dear Nick

Thank you for your letter of 8 October enclosing one from Stan Thorne MP about the reported increase in Leukaemia cases which have been associated with Windscale.

I enclose a draft reply for you to send to Mr Thorne. You will, however, need to write again once the further data has been assembled.

I am copying this to Bill Burroughs (Department of Energy), Ian Fair (Department of Employment), David Edmonds (Department of the Environment) and Garth Waters (MAFF).

Yours ever
Bessie Merkel

B C MERKEL
Private Secretary

Encs

DRAFT REPLY FROM THE PRIME MINISTER TO STAN THORNE, MP.

Thank you for your letter of 4 October regarding the report in "The Lancet" of 15 September 1979 of an increased incidence of leukaemia in western Lancashire. I have asked the Departments concerned to study the report with care.

It will be necessary to discover how the reported incidence in Lancashire compares with that for other regions and with national figures. The Office of Population Censuses and Surveys is being asked to provide the latest available figures.

Radiation levels in sea water and in fish and molluscs are monitored regularly and the results are published by the Ministry of Agriculture's Fisheries Radiobiological Laboratory. There has been an increase in radiation levels over the past two decades arising in part from atomic fallout, which reached a peak in the mid-1960's, and in part from discharges from nuclear sites.

The important question is whether there is a connection between radiation levels of the order of those encountered in the west Lancashire area and the incidence of leukaemia. The levels of radioactivity which have been recorded in sea water fish and molluscs do not provide a satisfactory explanation by themselves and I am sure that you will appreciate that there are several other possible reasons for the reported increase in the incidence of leukaemia.

we are seeking

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The advice of the National Radiological Protection Board and of the Medical Research Council ~~is being sought~~.

As soon as we have got together this

Once ~~the~~ further data and advice ~~have been assembled~~ I will write to you again.

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10 DOWNING STREET

PRIME MINISTER

This letter from Stan Thorne raises the question of the reported increase in Leukaemia in coastal areas in the North West - with the implication that radio-active waste from Windscale is responsible.

We will let you have a draft reply.

MS

8 October 1979



Mr. S. THORNE

10 DOWNING STREET

From the Private Secretary

8 October 1979

I attach a copy of a letter the Prime Minister has received from Stan Thorne, M.P. about the reported increase in Leukaemia cases which some people have associated with Wind-scale.

I should be grateful if you, in consultation with the other interested Departments, could let me have a draft reply for the Prime Minister to send to Mr. Thorne, to reach us here by Thursday 18 October.

I am copying this letter and its enclosure to Bill Burroughs (Department of Energy), Ian Fair (Department of Employment) and David Edmonds (Department of the Environment).

N. J. SANDERS

Don Brereton, Esq.,
Department of Health and Social Security.

5

Incidence of Myeloid Leukaemia in West Lancashire

Briefing note for Prime Minister

Background

1. Report in 'The Lancet'

A report (by Dr Geary, Dr Benn and Professor Ian Leck of Manchester University) of a significant increase in the number of registered cases of myeloid leukaemia and associated disorders appeared in "The Lancet" on 15 September. This suggested that the incidence of these diseases had almost doubled since 1969. The report also quoted data showing that levels of radio-activity in the Northern Irish Sea have increased markedly in recent years and suggested that the two phenomena might be linked.

2. Press reports

The report was given wide publicity in the press (The Financial Times, Guardian, Daily Telegraph) and it was inevitably suggested that the nearby Windscale plant might be responsible.

3. HP interest

Mr Stan Thorn, the hon. member for Preston wrote to you seeking an inquiry and Edward Gardner Q.C., the hon member for South Fylde, has written to the Secretary of State for Social Services. Mr Laurie Pavitt (Brent North) and Mr Lewis Carter Jones (Eccles) have both tabled written questions about leukaemia statistics and research.

Leukaemia

Leukaemia is a cancer-like disease of the white blood cells and affects the bone marrow and other blood forming tissues. Several different forms of leukaemia are distinguished according to the kind of leucocyte found and whether the condition is acute or chronic. Since 1968 available data, distinguishes lymphatic, myeloid, monocytic and other and unspecified leukaemias.

5. Data on leukaemia

Figures for the incidence of leukaemia (new registrations) and mortality from leukaemia are collected and published by the Office of Population Censuses and Surveys. Figures for incidence are available up to 1974: those for mortality up to 1977. Mortality figures are derived from death certificates. The incidence figures are less up to date and of varying reliability because they depend on the voluntary reports of doctors to Regional Cancer Registries and thence to OPCS. The effectiveness of the Registries varies but that for the north-west (Manchester region) is reported by OPCS to be particularly good. An Advisory Committee is due to report in the middle of the year on possible ways of improving cancer registration as a whole. A recent offer from the Cancer Research Campaign to contribute to the funding of the scheme is being discussed shortly with Minister of State (Health).

6. Research on leukaemia

The Medical Research Council, the Cancer Research Campaign and the Leukaemia Research Fund are all supporting research programmes on leukaemia. The United Kingdom is also participating in epidemiological research sponsored by the International Agency for Research on Cancer of the World Health Organisation and is about to collaborate in a European study of the possible relationship between leukaemic states and occupational and environmental factors.

7. Leukaemia and radiation

The cause of leukaemia is not known. There is evidence that radiation may be a causative factor particularly in childhood leukaemia but the evidence that low-level radiation is a cause of leukaemia in adults is less clear.

8. Other causes of leukaemia

Some industrial chemicals have been linked to leukaemia eg benzene. The number of cases caused by industrial exposure are a very small proportion of the total. There may be a genetic predisposition to leukaemia but the trigger factors have not been identified.

9. Radiation levels in sea water

Radiation levels in sea water and in fish and molluscs are monitored regularly and the results are published by the Ministry of Agriculture's Fisheries Radiobiological Laboratory. There has been an increase in radiation levels over the past two decades arising in part from atomic fallout, which reached a peak in the mid-1960's, and in part from discharges from nuclear sites.

Internationally recognised safety standards for the exposure of the population to radiation have not been exceeded as a result of this increase.

8 October 1979

I am writing on behalf of the Prime Minister to thank you for your letter of 4 October about the recent reports of increases in Leukaemia cases in the North West. I will place your letter before the Prime Minister and you will be sent a reply as soon as possible.

N.J. SANDERS

S.G. Thorne, Esq., M.P.

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HOUSE OF COMMONS
LONDON SW1A 0AA

cc: Dow

R6/10

SGT/JH

4 October 1979

The Rt.Hon.Mrs.Margaret Thatcher,M.P.,
10 Downing Street,
LONDON SW1.

Dear Prime Minister,

You will no doubt have read of the Research Scientists
at Manchester University, and their Report on the
increased incidence of Leukaemia off the coast of
Fylde.

Since the people of Preston may be subject to risk
arising from this Report, I would request a full
investigation by the Department of Health, Environment
and Industry in regard to the whole question of nuclear
development in the West Lancashire area, and the marked
rise in Leukaemia deaths.

Yours sincerely,

PP S.G. Thorne, M.P.

