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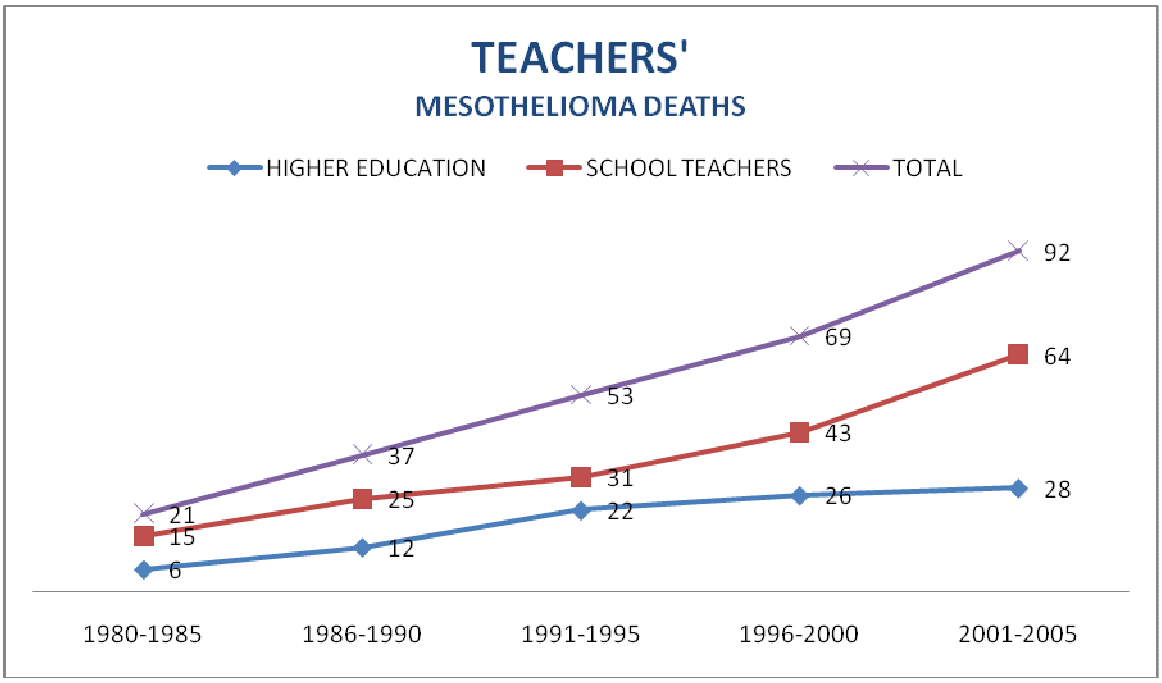
Education Sector Mesothelioma Occupational Statistics 1980-2005



TEACHERS MESOTHELIOMA DEATHS

The graph shows the number of mesothelioma deaths of school teachers and also teachers and lecturers in higher and further education. As can be seen the numbers increase year on year. Mesothelioma is almost always caused by exposure to asbestos, and there is no known minimum level below which there is no risk.[1] However the cancer is normally caused by a large exposure to asbestos or by a number of low level exposures which have a cumulative effect.[2]

The latencies for mesothelioma vary but can be from about ten to over sixty years from the time of the first exposure to asbestos to the onset of symptoms, with an average latency of 30-40 years. [3] All exposures are cumulative and can contribute towards the development of a tumour until about ten years before the onset of symptoms.[4]

[1] DfES Admin Memo 3/86 Welsh Office Admin Memo 1/86. The Use of asbestos in Educational Establishments p1 Aug 1985 International Programme on Chemical Safety. (1998) Environmental Health Criteria 203 Chrysotile asbestos. WHO Geneva
[2] HSE Asbestos Essentials HSG210 March 2005 p1. HSE Managing asbestos in workplace buildings. IND (G) 223 L 8/96 1996
[3]. CancerBacup Causes of mesothelioma 27 Mar 2008
[4] Edgson v Vickers QBD 1994 expert witnesses Dr Rudd, Dr Britton. P524

The above numbers are likely to be less than the actual numbers as the statistics do not record the person's occupation when they are aged 75 and over, and it is known that many deaths occur above this age.

The numbers of teachers dying from mesothelioma are statistically significant, and therefore although some might have experienced asbestos exposure in some other occupation, the majority are likely to have been exposed in their profession as a teacher at school.

Increasing deaths

Between 1980-1985, 21 teachers and lecturers died. (Southampton coding)
Between 1986-1990, 37 teachers and lecturers died.
Between 1991-1995, 53 teachers and lecturers died.
Between 1996-2000, 69 teachers and lecturers died
Between 2001-2005, 92 teachers and lecturers died (SOC 90. 2000)

The following table gives the deaths from mesothelioma amongst male and female teachers in higher education and in primary, secondary and special schools, and shows the increase over time:

Increasing deaths amongst teachers and lecturers

(Southampton)[5]	1980-1985	1986-1990	1991-1995	1996-2000	2001- 2005 (SOC 90,2000)
HIGHER EDUCATION					
MALE	6	12	22	26	24
FEMALE					4
TOTAL HIGHER EDUCATION	**6**	**12**	**22**	**26**	**28**
TEACHERS NEC , SCHOOL TEACHERS					
MALE	11	16	18	27	42
FEMALE	4	9	13	16	22
TOTAL TEACHERS NEC SCHOOL TEACHERS	**15**	**25**	**31**	**43**	**64**
TOTAL HIGHER EDUCATION & SCHOOL TEACHERS	**21**	**37**	**53**	**69**	**92**

NB: It should be noted that the Southampton codes only listed teachers in higher education and teachers nec, whereas the SOC1990 codes break the occupation down into three separate codes for each and the SOC2000 into three groups for higher education and four for school teachers, with an additional code for senior educational administrators. Therefore to compare like with like in the tables the higher education numbers have been added together, as have the school teaching professions.

[5] HSE Mesothelioma occupational statistics: Male and female deaths aged 16-74 1980-2000 Table 3,4 Southampton Occupation Group. 5 year time period 1980-2000 excluding 1981

The five year tables above from 1980-2000, includes the only two groups of teachers under Southampton occupational coding -Teachers nec and teachers in higher education. For some reason the HSE table does not include female teachers in higher education, even though statistics show that there were some deaths. In addition education assistants, nursery nurses and childcare related occupations are not classified separately under this coding but are "lost" amongst other groupings. Therefore some mesothelioma deaths are not included. [6]

Average annual number of teachers and lecturers dying from mesothelioma

The following table shows how many school teachers and teachers/lecturers in higher education have died each year from mesothelioma:

1980-1985	1986-1990	1991-1995	1996-2000	2001-2005
School teachers				
3 a year	**5** a year	**6** a year	**9** a year	**13** a year
Higher education				
1 a year	**2** a year	**4** a year	**5** a year	**6** a year
Total Higher education and School teachers				
4 a year	**7** a year	**11** a year	**14** a year	**18** a year

(NB: Southampton code for 1980-2000. SOC1990 and SOC2000 code for 2001-2005. Numbers are taken to nearest decimal point)

US statistics highlight primary school teachers mesothelioma deaths.

In 2003 a US Government publication listed occupational deaths from mesothelioma. They stated:

"*Occupations associated with significantly elevated mesothelioma mortality in 1999 include: plumbers, pipefitters and steamfitters, mechanical engineers, and* ***elementary school teachers."***[7]

Conclusion on teachers' mesothelioma deaths

The numbers of teachers dying from mesothelioma is significant and shows that there has been considerable asbestos exposure in the teaching profession. For sake of argument let's assume that the latencies were average and all exposures were cumulative up until about ten years before their deaths: Then for the period up to 1985 when 15 school teachers died their exposures started in the mid 1940s and all subsequent exposures had a contributory effect until about 1975. Immediately post war asbestos was used in schools and its use increased throughout the 1960s and 1970's when it was used in very large amounts. The consequential effects can be seen in the ever increasing numbers of deaths, for 64 school teachers died in the latest period up to 2005, and it is likely that their asbestos exposures started in the mid 1960's and all exposures until about 1995 were contributory. It is known that over the years the asbestos has been deteriorating and releasing fibres, it therefore must be assumed that the deaths from mesothelioma in the teaching profession will continue for many decades to come as a direct legacy of the large amounts of asbestos that has been used in the construction of our schools.

[6] (HSE mesothelioma occupational statistics male and female deaths aged 16-74 1980-2000 (Southampton coding) 5 year time period. Tables 3,4.)

[7] US Department of Health and Human Services. Work-Related Lung disease Surveillance Report 2002 Selected Highlights page xxvii

CHILDREN MESOTHELIOMA DEATHS

Everyone attends school as a child, there are about 800,000 teachers and 9,000,000 children in our schools at any one time. A child could be unfortunate enough to spend the twelve years of their school career in a school that contains asbestos in bad condition, and then the next three years in a college that could also be in a similar condition. As well as living longer for the disease to develop, children are also more vulnerable to the effects of asbestos exposure.[8] The HSE Head of Asbestos Policy stated about the risks to children in schools:

"*Due to their physical immaturity they are at greater risk of suffering from asbestos related disease than adults, and will live long enough for any disease to develop."*

It is not known how many children have been exposed to asbestos at school and have subsequently died. That is because, in most cases, the latencies for these cumulative "low level" exposures are probably at or above the average latency of 30 to 40 years. Hence the deaths will be recorded under whatever occupation they had at the time, and the statistics will not show that they were as the result of exposure at school.

US estimate that 90% of mesothelioma deaths in schools would be from childhood exposure.

In 1980 the American Environmental Protection Agency (EPA) wrote a report giving a best estimate of 1000 deaths from asbestos exposures in their schools. They considered that 90% of these deaths would be from childhood asbestos exposure at school. [9] However by law all schools were then required to identify the extent of their asbestos, and it was found that five times more children were at risk.[10] The UK government has been asked, but have refused to make an estimate of the risks.[11] It is probable that the proportion of deaths amongst teachers and children is similar in this country to that in the USA.

Conclusion on children's mesothelioma deaths.

The statistics for teachers, nursery nurses, assistants and lecturers should therefore be treated as the barometer, or the tip of the iceberg, for children will have been exposed to asbestos at the same time as the adults in the classrooms. Regrettably as a direct result it is probable that many will have subsequently died of mesothelioma and many will die in the future.

ANALYSIS OF STATISTICS – MESOTHELIOMA DEATHS

The following section examines the education sector mesothelioma statistics for 2001-2005. An analysis of the 1991-2000 education sector mesothelioma statistics is given in the paper "Asbestos in Schools" on the web- site: www.asbestosexposureschools.co.uk

[8] American Academy of Pediatrics Asbestos exposure in schools. 1987 Pediatrics vol79, 2,Feb 87 p302. HSE Asbestos campaign- Background to Education Sector Initiative Nov 04. Harvard Medical School, Massachusetts General Hospital Dr C.Oliver Jan 05. National Archives. Head of the Medical Inspectorate of Factories 1966- 68 DES file Asbestos in schools. US EPA Asbestos in schools updated 2005. American Academy of Pediatrics Asbestos Exposure in schools Vol 79 no 2 Feb 87. The Quantative risks of mesothelioma and lung cancer in relation to asbestos exposure. HSE Hodgson , Darnton 2000 p581. HSE Asbestos campaign- Background to Education Sector Initiative Nov 04.

[9] EPA report Health effects and magnitude of exposure of Asbestos containing materials in school buildings. 560/12-80-003

[10] EPA Fact sheet AHERA 1986 statement EPA Administrator 23 Oct 86

[11] Parliamentary question 4210 Michael Clapham MP/ DfEE 17 Jun 1997

Education Sector Mesothelioma Occupational Statistics 2001-2005

SOC 2000	DESCRIPTION	MALE			*FEMALE*		
		DEATHS 2001-2005	**[EXPECTED DEATHS for 2002-2005]**	**[PMR for 2002-2005]**	***DEATHS 2001-2005***	***[EXPECTED DEATHS for 2002-2005]***	***[PMR for 2002-2005]***
	HIGHER EDUCATION. INSPECTORS						
2311	Higher education teaching professionals	**10**	[10]	[40]	***1***	*[1]*	*[163]*
2312	Further education teaching professionals	**13**	[16]	[61]	***3***	*[2]*	*[164]*
2313	Education officers school inspectors	**1**	[2]	[57]	***0***	*[0]*	*[0]*
	Total	**24**		**[WA 48]**	***4***		***[WA 164]***
	Total male and female	**28**					
	SCHOOL TEACHERS						
2314	Secondary	**36**	[39]	[83]	***2***	*[4]*	*[50]*
2315	Primary and nursery	**5**	[7]	[72]	***17***	*[18]*	*[79]*
2316	Special needs	**0**	[1]	[0]	***1***	*[1]*	*[140]*
2319	Teaching professionals nec	**1**	[4]	[28]	***2***	*[1]*	*[140]*
	Total	**42**		**[WA 80]**	***22***		***[WA 86]***
	Total male and female	**64**					
	Total Higher Education + School Teachers	**Male 66**			**Female 26**		
		92					
	NURSERY. ASSISTANTS. CHILDMINDERS						
6121	Nursery nurses				***4***	*[2]*	*[192]*
6122	Childminders and related occupations				***2***	*[2]*	*[57]*
6123	Playgroup leaders/assistants				***0***	*[0]*	*[0]*
6124	Educational assistants				***2***	*[3]*	*[66]*
9244	School mid-day assistants				***3***	*[4]*	*[46]*
	Total				***11***		***[WA 105]***
	Total male and female	**11**					

	TOTAL EDUCATION SECTOR [excluding caretakers, cleaners, school secretaries]		
	Male	**66**	
	Female	**37**	
	Male and female	**103**	
	Weighted average PMR [2002-2005]	**[Male 68]**	**[Female 100]**

[12]

NB:
In an occupation where there should be minimal or no asbestos exposure the above statistics show that there has been a significant exposure. The numbers of deaths and the associated Proportional Mortality Ratios (PMRs) under each individual code in their own right are far too high. However the teaching profession is amongst the few where the statistics split the occupation into many different codes, which is a bonus when attempting to define for instance whether primary or secondary teachers suffer more mesothelioma, but what it tends to do is make the numbers seem less significant than they actually are. It is only when they are examined as a group that the numbers show their true significance.

The data for 2001-2005 uses the SOC1990 occupational coding for the first few months of 2001 and SOC2000 for the remainder of 2001. The period 2002-2005 only uses SOC2000 coding. Because of this HSE took the decision not to include data for 2001 in the published statistics.[13] However HSE Statistics Branch kindly provided me with the mesothelioma deaths in the education sector for 2001, they did not however provided the expected deaths or the PMRs for the period. The above tables therefore only include the expected deaths and PMRs for the period 2002-2005. The weighted averages are also based on the number of deaths during the 2002-2005 period.

Proportional Mortality Ratio (PMR).

The number of people in each occupation is different, therefore a large number of deaths from mesothelioma in an occupation employing very few people would be more remarkable than the same number of deaths in an occupation employing many thousands of people. A system has been devised to reflect this, and that is called the Proportional Mortality Ratio. It gives a comparison of mesothelioma deaths between occupations. A PMR of 100 shows that the number of mesothelioma deaths in a particular occupation is average for all the occupations. However that includes the high risk occupations such as ship-building, weaving asbestos cloth and the construction industry where asbestos exposure is known to occur. Therefore an "average" PMR shows that considerable asbestos exposure has occurred, whereas in professions such as teaching the PMRs should be far less than "average."

"Expected" deaths is a misnomer.

It is also important to note that the term "Expected deaths" is a misnomer. In the teaching profession there should be minimal or no asbestos exposure, therefore one should not "expect" any deaths from mesothelioma. At the most the deaths should be no more than those from a background asbestos exposure. For the "expected" number of deaths is based on an average of all occupations including the high risk ones. In an occupation with a hypothetical zero exposure the PMR for females would be 36 and for males 6,[14] it can therefore be seen in the education sector the number of deaths amongst males is about eleven times greater than it should be, had there

[12] E-mail HSE Statistics Unit/Lees 15 Jul 2008. Mesothelioma deaths in the education sector for males and females 2001-2005. HSE Mesothelioma mortality in Great Britain: Analyses by Geographical area and occupation 2005 Tables 11, 13 (2002-2005)
[13] HSE Mesothelioma mortality in Great Britain: Analyses by Geographical area and occupation 2005 Occupational analysis page 3 para 7
[14] HSE Mesothelioma occupation statistics male and female deaths aged 16-74 page 5 interpretative issues.

been no exposure, and with females their deaths are three times greater. Both demonstrate a considerable exposure to asbestos. The unexpectedly high level of deaths from mesothelioma in the teaching profession has been highlighted by the HSE Statistics Branch who stated in 2004:

"Perhaps in this case the term "expected" is unfortunate because it could give the impression that if the observed deaths are in line with the expected deaths then there is no risk.

The PMR of 100 (average, expected*) does not indicate that there is no risk*…..*Even if the proportion of mesothelioma deaths among teachers was in line with the proportion of females that are teachers, one could still draw the conclusion that there are too many deaths among a group which are supposed to have had very little asbestos exposure."*[15]

Number of teachers' deaths is greater than shown in the statistics

The numbers of teachers dying from mesothelioma is more and possibly significantly more, than shown in the statistics. That is because the occupational statistics do not list a person's death from mesothelioma once they are over the age of 74, and because of the long latency of mesothelioma, many people die at a greater age than this. For instance 603 women died from mesothelioma over the age of 74 in the period 1991-2000 and their deaths have not been included in the occupational statistics. The HSE statistics also give 456 non-working female deaths between the ages of 16-74 in 1991 to 2000.[16] Consequently a total of 1,760 females died from mesothelioma during this period, of which for various reasons 1,059[17] have not been included in the occupational statistics. Therefore it is most important to bear in mind that the number of deaths included in the occupational statistics is substantially less than the actual number. It is likely that a significant number of teachers who have died of mesothelioma have not been listed in the occupational statistics.

TEACHING ASSISTANTS AND CHILDCARE RELATED OCCUPATIONS DEATHS

Nursery nurses, education assistants, midday assistants and childcare related occupations have been included in this summary because they also work with children, many of them in classrooms in schools, the only difference in most cases being that they do not hold a professional qualification and hence they are not coded in the occupational statistics under the "professions." It is only since 1991 that these occupations have been listed separately therefore it is not possible to make conclusions on the trends, however the data for the ten year period from 1991-2000 shows 17 deaths in this group and that for the five year period from 2001-2005 gives 11 deaths. The weighted average PMRs for the group in both periods are also above 100, all of which indicates a significant asbestos exposure in occupations where one should expect none. Although the numbers are not high enough to be statistically significant on their own, they tend to confirm all the other data of asbestos fibre release in schools and the exposure of the occupants whatever their occupation.

[15] HSE Statistics Branch/Lees 22 Oct 04
[16] HSE MESO01 Death certificates mentioning mesothelioma. Compared with HSE Mesothelioma occupational statistics Table 8.
[17] HSE Mesothelioma statistics Tables MESO01, MESO03

SCHOOL SECRETARIES. CARETAKERS AND CLEANERS (All Occupations)

	1991-2000 [SOC1990][18] 10 years			2002-2005 [SOC2000][19] 4 years		
	DEATHS	**EXPECT**	**PMR**	**DEATHS**	**EXPECT**	**PMR**
SCHOOL SECRETARIES 4213						
MALE						
FEMALE				**5**	2	231
672 **CARETAKERS (all occupations)** 6232						
MALE	**50**	81	62	**37**	35	106
FEMALE	**4**	3	142	**1**	2	53
TOTAL	**54**			**38**		
958 **CLEANERS (all occupations)** 9233						
MALE	**39**	51	77	**17**	26	66
FEMALE	**55**	62	89	**45**	42	106
TOTAL	**94**			**62**		

[20]

NB:
The data for 2001 has not been published by HSE and therefore the later period is only the four years 2002-2005

SOC2000 coding lists school secretaries separately whereas previously in the Southampton coding they had been included under a general code that included all secretaries and in the SOC1990 coding had presumably been included under "other secretaries." Although the numbers are relatively small they do add to the evidence of raised airborne asbestos fibres and cumulative exposures of the occupants of schools from all occupations.

The deaths amongst cleaners and caretakers have been included as they are both raised. Unfortunately though in both cases the occupational codes include caretakers and cleaners in every occupation and not just schools, therefore it is not possible to state how many had worked in schools.

In both periods 1991-2000 and 2002-2005, the individual occupational code with the greatest number of mesothelioma deaths amongst females, are cleaners.

School caretakers are acknowledged to be at risk because of their jobs they are likely to disturb asbestos materials. There are numerous cases of school maintenance men and caretakers drilling walls to hang up notice boards, fitting ceiling tiles, removing ceiling tiles to mend leaks, patching up dents in walls and a whole plethora of other tasks all of which can potentially disturb asbestos. HSE and DfES highlight the risk by stating:

[18] HSE Mesothelioma occupational statistics: Male and female deaths aged 16-74 1980-2000 tables 7-8.
[19] HSE Mesothelioma mortality in Great Britain: Analyses by Geographical area and occupation 2005 Tables 11, 13 (2002-2005)
[20] HSE Mesothelioma occupational statistics: Male and female deaths aged 16-74 1980-2000 tables 7-8. HSE Mesothelioma mortality in Great Britain: Analyses by Geographical area and occupation 2005 Tables 11, 13 (2002-2005)

"*School caretakers have been identified as a particular group at risk due to the nature of their work (ie. Drilling and fixing.)* [21]

In the USA studies have been carried out into the prevalence of asbestos related disease in school custodians. In one large study more than a fifth had pleural plaques and there was no evidence of asbestos exposure before they became custodians.[22] The Health Effects Institute report stated:

"In both studies, a significant proportion of custodians, without known asbestos exposure prior to their employment with the school board, had radiographic abnormalities (parenchymal ,pleural or both) consistent with the presence of asbestos-related disease."[23]

Although there are documented cases of school caretakers developing mesothelioma once again there are no specific statistics for school caretakers in the UK as the occupational classification includes all caretakers of churches, schools, offices and other buildings and furnishings.[24]

All the evidence points towards the fact that school caretakers have been exposed to frequent and significant levels of asbestos, if they have then others will have been as well.

CONCLUSION

The statistics show that a considerable number of school teachers, assistants, nursery nurses and college lecturers have died of mesothelioma. The latest statistics show that a significant number of school secretaries have also died of the disease. In addition it is probable that a significant number of school caretakers, cleaners and cooks have died of mesothelioma. All of these people have worked in schools or colleges, all their deaths are the direct result of asbestos exposure. Although one should not expect any asbestos exposures in schools these deaths are statistically significant and are proof that it has happened. They are also proof that as the asbestos deteriorates the number of mesothelioma deaths gradually and inexorably has increased. No doubt some exposures have been the result of documented incidents where perhaps building or maintenance work is known to have released asbestos fibres, however other exposures have occurred without being recorded and without being noticed. Amongst these are the exposures from common everyday classroom activities such as slamming a door or knocking a wall, both of which can release significant levels of asbestos fibres. All exposures are cumulative, all contribute towards the development of the cancer.

Children have been exposed at the same time as the adults and because of their particular vulnerability to asbestos it is probable that many have subsequently developed mesothelioma and have died, and many will die.

Most schools contain asbestos, in some the asbestos is in a bad state and is not being adequately managed so the release of asbestos fibres continues. Because of the long latency it is inevitable that the deaths caused by asbestos exposures in the nation's schools will continue for decades to come.

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[21] HSE Asbestos An important message to schools Mar & Aug 2006. DfES Asbestos An important update for schools Jun 2006

[22] Asbestos-related disease in public school custodians. Oliver et al. American Journal of Industrial Medicine 19:303-316 (1991)

[23] HEI Asbestos in public and commercial buildings. 1991 A2.3.1.5

[24] National Statistics Standard Occupational classification 2000 Vol 1

Annex:
Mesothelioma deaths in the education sector for males and females 2001 - 2005

Males

Job Title	Deaths
2311 - Higher education teaching professionals	10
2312 - Further education teaching professionals	13
2313 - Education officers, school inspectors	1
2314 - Secondary education teaching professionals	36
2315 - Primary & nursery education teaching professionals	5
2316 - Special needs education teaching professionals	0
2317 - Registrars & senior administrators of educational establishments	0
2319 - Teaching professionals n.e.c.	1
6121 - Nursery nurses	0
6122 - Childminders & related occupations	0
6123 - Playgroup leaders/assistants	0
6124 - Educational assistants	0
9244 - School mid-day assistants	0
Group Total	66

Females

Job Title	Deaths
2311 - Higher education teaching professionals	1
2312 - Further education teaching professionals	3
2313 - Education officers, school inspectors	0
2314 - Secondary education teaching professionals	2
2315 - Primary & nursery education teaching professionals	17
2316 - Special needs education teaching professionals	1
2317 - Registrars & senior administrators of educational establishments	0
2319 - Teaching professionals n.e.c.	2
6121 - Nursery nurses	4
6122 - Childminders & related occupations	2
6123 - Playgroup leaders/assistants	0
6124 - Educational assistants	2
9244 - School mid-day assistants	3
Group Total	37

[25]

Michael Lees
5th August 2008

AL 2. 22nd September 2008

[25] E-mail HSE Statistics Unit Benson/Lees 15 July 2008