



**Industrial Injuries Advisory Council**

**The Changing Nature of Occupation  
and Occupational Disease**

**Proceedings of the conference to mark the 60<sup>th</sup> anniversary  
of the National Insurance (Industrial Injuries) Act 1946  
and the foundation of IIAC  
held at the  
Royal Society of Arts, John Adam Street, London,  
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**Professor Anthony Newman Taylor, CBE, FRCP, FFOM, FMedSci**  
**Chairman of the Industrial Injuries Advisory Council**

## **Foreword**

**Professor Anthony Newman Taylor CBE, FMed Sci – Chairman of the Industrial Injuries Advisory Council  
Head of the Occupational & Environmental Medicine, Imperial College School of Medicine at the National Heart and Lung Institute; Consultant Physician, Chief Executive, Medical Director and Director of Research at the Royal Brompton and Harefield NHS Trust**

1. The Industrial Injuries Disablement Benefit (IIDB) Scheme and its independent advisory body, the Industrial Injuries Advisory Council (IIAC) has reached a watershed. The nature of work and associated occupational diseases are undergoing considerable change. Whilst classical occupational diseases still occur and will continue to occur for several more decades, other types of work-related ill health, such as musculoskeletal disorders and mental health disorders, are increasingly common in the modern workforce.
2. Recommendations by IIAC for disease prescription in the IIDB Scheme are based on robust scientific evidence. This is an integral requirement of Industrial Injuries legislation. Scientific evidence frames which diseases are classified as occupational, defines their terms of prescription and informs what constitutes certain accidents under the Accident Provisions. Scientific evidence provides the basis for IIAC's ability to recommend prescription; its absence can preclude prescription.
3. We are currently facing the challenge of adapting and evolving the provisions of an occupational benefit scheme to suit the modern workforce and its associated ill health. The IIDB Scheme has adapted to the changing nature of work and associated ill health since its inception and I believe the Scheme will also adapt to the needs of contemporary and future ill health caused by work. As an example, Reduced Earnings Allowance, abolished by the government of the day in 1990, was arguably the most enlightened part of the Scheme. It enabled those with a prescribed disease to move from their current job, preventing disease progression while remaining in work. Such principles are very much in line with the current government agenda for work and welfare. IIAC as an expert body will be contributing its ideas for the reform of the IIDB Scheme during the course of the current Department for Work and Pensions review. I look forward to the next 60 years!



**Dr Keith Palmer MA, MSc, DM, FFOM, FRCP, MRCGP**

**Chairman of IIAC's Research Working Group**

## **Welcome**

**Dr Keith Palmer – Chairman of the IIAC Research Working Group  
Clinical Scientist and Consultant Occupational Physician at the MRC  
Environmental Epidemiology Unit, University of Southampton**

4. This conference marks a historic occasion for IIAC and for the IIDB Scheme - the 60th anniversary of the Act of Parliament that brought both the Council and the Scheme into being; and by fitting coincidence, a celebration of the centenary of the first official list of prescribed diseases under the Workmen's Compensation Act.
5. As highlighted in the Chairman's Foreword, the landmark is also a watershed - a chance to look back at the Council's achievements and, importantly, an opportunity to plan ahead, to ensure the Council makes a significant contribution to the modern agenda of health and welfare reform. It is appropriate that, with an eye to the future, the conference has as its focus: 'The changing nature of occupation and occupational disease'. We are fortunate indeed in having such a distinguished panel of speakers to share their perspectives with us.

## History and achievements

**Professor Anthony Newman Taylor, CBE, FMedSci - Chairman of IIAC  
Head of the Occupational & Environmental Medicine, Imperial College School  
of Medicine at the National Heart and Lung Institute; Consultant Physician,  
Chief Executive, Medical Director and Director of Research at the Royal  
Brompton and Harefield NHS Trust**

6. The IIDB Scheme and its predecessors have been providing compensation to workers who were sick or injured as a result of their work for over 100 years. The 1897 Workmen's Compensation Act gave a duty on employers to compensate their employees for loss of earnings due to accidents arising "out of and in the course of employment". This duty was without the need to show negligence. An accident was defined in 1903 by case law as an event "which is neither expected or designed". In 1906 Workmen's Compensation was extended to cover both accidents and diseases caused by work. Initially six diseases were included on the scheduled list of prescribed diseases – anthrax, ankylostomiasis and poisoning by lead, mercury, phosphorus, arsenic or their sequelae. Beveridge described the Workmen's Compensation scheme as the "pioneer system of social security in Britain".
7. A list of prescribed diseases necessitated the means to update it. The Samuel Committee, set up in 1907 to address this issue, stated that for a disease to be prescribed it had to be:
  - a) outside the category of diseases already covered by the Workmen's Compensation Act
  - b) such as to incapacitate a worker for more than a week
  - c) so specific to the employment that causation could be assumed in the individual case.
8. The implication of this last point was that diseases associated with certain industries could not be scheduled if they were also common in the population, e.g. bronchitis in flax workers.
9. This Scheme remained in operation until 1946. Why was there a need for change? In the foreword to the 'Social Insurance Part 2 Workmen's Compensation Proposals for an Industrial Scheme' published in September 1944 it was noted that for "nearly half a century the compensation of workmen for industrial injury has been a liability, imposed by law, upon their employer. Under the existing scheme, it has been open to the employer, and in some cases obligatory on him, to insure himself against this liability; while it has been for the workman to make his claim and to take steps to enforce it, if challenged in the Courts of Law. Inevitably compensation has thus become a disputable issue between the two parties or their representatives." Beveridge noted in his report that there was a disproportionate cost of administering the scheme compared with the cost issued in benefits to sick and injured workers due to this 'disputable' system.

10. In 1946 the Industrial Injuries Act transferred the responsibility for payment and administration of benefits from employers and insurance companies to the Ministry of National Insurance. Under the Act workers were compensated not for loss of earnings but for “loss of faculty in proportion to loss of health, strength and the power to enjoy life attributable to industrial accident or prescribed disease”. One additional benefit of the new Scheme was an exception in providing earnings replacement, Special Hardship Allowance (SHA) (which later became Reduced Earnings Allowance [REA]), introduced by the Minister for National Insurance, Mr Jim Griffiths. This was a particularly enlightened part of the scheme enabling workers to relocate and remain in work without suffering financial hardship.
11. The Minister of National Insurance commended the Industrial Injuries Bill to the House of Commons in October 1945 “not only because of its cash benefits, but also because it provides the foundation upon which a great constructive human service can be built, to restore the injured workman to his old job, or if that is impossible, to care for him and his dependents”.
12. Since its inception in 1946 until today the Industrial Injuries Scheme has developed and adapted to the challenge of a constantly changing world of work and associated diseases with benefits providing social value. I will use i) occupational exposure to coal resulting in pneumoconiosis and chronic bronchitis and emphysema and ii) occupational exposure to asbestos resulting in asbestosis, lung cancer and mesothelioma as relevant examples during the period.

#### Workmen’s Compensation and Coal

13. The Samuel committee in 1907 was unable to recommend prescription for silicosis, as silicosis, prior to the advent of the chest radiograph, was indistinguishable from other prevalent chest diseases, particularly tuberculosis. With the development of radiographs, silicosis could be distinguished on a chest X-ray, enabling silicosis in 1919 to become a prescribed disease. In 1928, prescription was extended to coal miners who could demonstrate silica rock dust exposure and were “totally disabled”. The Scheme was further extended to include “partially disabled” workers three years later. In 1934, the Scheme was extended to include any coal miner with silicotic nodules, whether or not they worked with hard rock. All coal miners with radiological evidence of pneumoconiosis from coal dust exposure were included in the Scheme only in 1943.
14. Workers compensated under the Workman’s Compensation Act for Coal Workers Pneumoconiosis (CWP) were “certified” and received weekly payments or a lump sum in benefits with compulsory suspension from mining to protect workers from further lung deterioration. Large numbers of workers were certified which resulted in unforeseen social problems. By the end of 1945, 12,000 men had been certified in South Wales and new cases were being certified at a rate of 100 men per week. Over two thirds of these men were under 50 years old and a quarter were under 40 years old. The majority

of the men had been coal hewers and faced the prospect of being out of work with no training for alternative employment. Hugh Jones and Fletcher (1951) noted that “at present some 5,000 men with pneumoconiosis, three quarters of whom are probably capable of work under normal industrial conditions, are unemployed”.

15. Advance only became possible with understanding of the nature and determinants of progression of CWP. The lungs have several mechanisms to remove inhaled coal dust. However if these are overwhelmed the dust accumulates in the lungs, appearing as nodules on chest radiographs. These nodules, which are retained coal dust, are not a cause of impairment or disability. This form of the disease was classified as simple pneumoconiosis. The severity of simple pneumoconiosis was graded according to the profusion of nodules seen on a chest radiograph, which is a reflection of the coal dust which has accumulated in the lungs. In some cases of simple pneumoconiosis large nodules of fibrosis develop resulting in Progressive Massive Fibrosis (PMF), resulting in significant disability and premature mortality. In the 1950s it was believed that PMF was a form of tuberculosis. However, Cochrane (1962) showed that the risk of PMF was related to the category of simple pneumoconiosis, i.e. due to the amount of coal dust in the lungs. He showed that if workers with category 2 pneumoconiosis were removed from further dust exposure the disease would not progress to PMF. Jacobsen and his colleagues at the Institute of Occupational Medicine in Edinburgh showed that category 2 pneumoconiosis occurred in 4% of those exposed to exposures of  $4\text{mg m}^{-3}$  coal dust over a 35 year working lifetime. Therefore, procedures were put into place to reduce the risk of exposures linked to the onset of category 2 pneumoconiosis. Also workers with category 2 pneumoconiosis were moved to less dusty working conditions. The Special Hardship Allowance part of the Industrial Injuries Scheme enabled the redeployment of workers to less dusty conditions by providing earnings replacement for the move to less hazardous but less financially rewarded work.

#### Asbestos and asbestosis, lung cancer and mesothelioma

16. Asbestos was increasingly used from the late nineteenth century because of its thermal insulating properties. Inhaled asbestos fibres of greater than  $5\mu$  in length are too long to be cleared from the lungs. The fibres accumulate in the lungs and can cause fibrosis and cancer. The following timeline shows the evolution of knowledge about the adverse health effects associated with asbestos:
  - 1899 Montague Murray reports a post-mortem case of pulmonary fibrosis in an asbestos worker.
  - 1900 Cooke reports the case of 33 year old Nellie Kershaw who died of pulmonary asbestosis after working 20 years in an asbestos textile factory. First use of the term ‘asbestosis’.
  - 1930 Merewether and Price report the increased prevalence of asbestosis in asbestos textile workers.

- 1947 Merewether reports excess lung cancer deaths in those with asbestosis compared to those with silicosis.
- 1955 Doll provides evidence of the association between lung cancer and asbestos.
- 1960 Wagner *et al.* provides evidence of the association between mesothelioma and asbestos.

17. Merewether and Price (1930) reported that there was an increased risk of fibrosis in asbestos textile workers which increased with increased duration of employment.

Years employed	Number examined	Prevalent cases of fibrosis		
		Number	%	Average age
0-4	89	0	-	-
5-9	141	36	25.5	36
10-14	84	27	32.1	40.4
15-19	28	15	53.6	43.4
20+	21	17	80.9	52.7
<b>Totals</b>	363	95	26.2	41.4

After Merewether and Price, 1930

- 18. The numbers of prevalent cases of fibrosis was probably an underestimate as employees whose health was most affected by the asbestos would have left the workforce due to ill health.
- 19. The contemporary Chief Medical Inspector of Factories Annual Report showed the number of deaths from asbestosis was small compared to the number of those with CWP, primarily because of the considerably larger number of people working in the coal mining industry. The importance of asbestos was therefore underestimated as a risk to health. However this changed with Doll's report of the association of lung cancer, and Wagner's report of the association of mesothelioma, with exposure to asbestos.
- 20. Mesothelioma is a rare respiratory cancer. In 1960, Wagner, Sleggs and Marchand reported the association between mesothelioma and exposure to asbestos in the North Western Cape Province of South Africa. They found that mesothelioma has a long latent interval between first exposure and the onset of the disease (usually > 20 years) and a short survival from diagnosis (< 1.5 years). At present in the UK the great majority of cases of mesothelioma are caused by exposure to asbestos.

Exposure (crocidolite)	Mesothelioma (number)	Latency in NW Cape Province, South Africa (years)
Mining or transport	10	21-43
Insulation work	4	18-29
Neighbourhood	18	35-44
Unknown	1	-

Mean age = 49 years

After Wagner, Sleggs and Marchand, 1960

21. In the UK there has been a high incidence of cases of mesothelioma clustered in areas historically associated with asbestos work, where ship and railway manufacture and repair was undertaken. Before the 1960s the Royal Naval Devonport dockyards used considerable quantities of crocidolite and amosite asbestos. However, from the mid 1960s alternative insulation material was used and respiratory protection provided. Hilliard *et al.* (2003) have shown that these measures have resulted in a decrease in the number of cases of mesothelioma since the early 1990s. However, these preventative and protective measures were not implemented in the UK in the construction industry until the 1970s or 1980s with a consequent continuing increase in the incidence of mesothelioma. Peto *et al.* (1995) has estimated that the peak of the UK epidemic of mesothelioma caused by this continuing asbestos exposure will not be reached until 2011-2015, with two thirds of the cases yet to occur.
  
22. Mesothelioma is almost exclusively caused by asbestos and can be caused by relatively low levels of exposure to asbestos which was reflected in the IIDB prescription as “exposure to asbestos, asbestos dust or any admixture of asbestos at a level above that commonly found in the environment at large”. Claims for mesothelioma are now ‘fast-tracked’ by the Department for Work and Pensions meaning there is no 90 day waiting period, claimants are automatically awarded 100% assessments and there is no absolute requirement for corroborative evidence of occupational exposure.
  
23. In contrast to mesothelioma, which other than in those exposed to asbestos is a rare tumour, lung cancer is common, primarily caused by cigarette smoking, making its relationship to asbestos exposure more difficult to discern. Montague Murray recognised in 1947 that cases of asbestosis were more likely than cases of silicosis to die to die of lung cancer.

<b>Pneumoconiosis and lung cancer (at post-mortem)</b>		
	<b>Deaths (n)</b>	<b>Lung cancer (%)</b>
<b>Asbestosis</b>	235	13.2
<b>Silicosis</b>	6884	1.2

After Merewether, HM Inspector of Factories, 1947

24. Subsequently Doll in 1955 provided unequivocal evidence of a greatly increased risk of lung cancer in those with asbestosis.

<b>Causes of death in men employed in a Rochdale asbestos textile factory</b>		
<b>Cause of death</b>	<b>Number of deaths</b>	
	<b>Observed</b>	<b>Expected</b>
<b>Lung cancer</b>		
<i>With asbestos</i>	11	-
<i>Without asbestos</i>	0	1

<b>Other lung diseases</b>		
<i>Asbestos</i>	14	-
<i>Other</i>	6	8
<b>Other cancers</b>	4	2
<b>Other causes</b>	4	5
<b>All causes</b>	39	16 (15.4)

After Doll, 1955

25. The case for prescription of lung cancer in asbestos workers without asbestosis was more complex due to the lack of specific clinical features to differentiate cases of lung cancer in the general population. Evidence suggested that in certain workers, such as asbestos textile workers, there was an excess of cases of lung cancer in those working with asbestos compared to the expected number.
26. The criteria for prescription of an occupational disease which, like lung cancer, also occurred in the absence of occupational causation was given by the Beney Committee (Minority Report) 1955:  
 “Prescription should be regarded as satisfied in relation to a disease where it was probable that more cases than not were occupational in origin whether or not individual cases could be attributed to the nature of employment”.
27. In other words, a prescribed disease should be a) a recognised risk to workers in an occupation or exposed to a particular agent and b) that attribution of the disease to an occupation or agent should be based on the balance of probabilities, i.e. is more likely than not.
28. IIAC recently reviewed the evidence for asbestos-related diseases and recommended that lung cancer in the absence of asbestosis be prescribed for “exposure to asbestos for at least 5 years before 1975 and 10 years after 1975 in the following occupations i) workers in asbestos textile manufacture; ii) asbestos sprayers and iii) asbestos insulation work, including those applying and removing asbestos containing materials in shipbuilding.

#### Chronic bronchitis and emphysema (COPD) and coal dust

29. Cancer is an ‘all or nothing’ disease, i.e. you either have cancer or you do not. IIAC also has to consider prescription where the nature of the disease is ‘more or less’, i.e. there are degrees of disease, such as airway narrowing in chronic bronchitis and emphysema.
30. Lung function can be assessed by measuring the volume of air a person can exhale. The total volume of air that can be exhaled is called the forced vital capacity (FVC) and the volume of air that can be exhaled in one second is forced expiratory volume in 1 second (FEV<sub>1</sub>). A person with airflow limitation will have a lower FEV<sub>1</sub> and FEV<sub>1</sub>/FVC than a normal individual. Cochrane and Higgins (1961) showed that while miners and ex-miners had lower lung function than non-miners, miners and ex-miners with simple coal workers

pneumoconiosis did not show increasing loss of FEV<sub>1</sub> with increasing category of simple pneumoconiosis, although lung function was decreased in miners and ex-miners with progressive massive fibrosis. He inferred that chronic bronchitis and emphysema was not a hazard of coal mining. However Cockcroft *et al.* (1982) found that emphysema was more frequent in coal miners than non-miners, with an odds ratio of 10.35 after adjusting for age and smoking. Subsequently Marine *et al.* (1988) showed that the proportion of coal miners with a FEV<sub>1</sub> < 65% was doubled in those with high, as compared to low, exposure to coal dust in both smokers and non-smokers. Taking this evidence together IAC were able to recommend prescription for chronic bronchitis and emphysema in coal workers.

31. In considering the terms of prescription for coal workers the Council asked the following questions:
32. What is a disabling loss of FEV<sub>1</sub>? Studies had shown that a reduction in FEV<sub>1</sub> of 1L was association with shortness of breath when walking with others on level ground.
33. Is there evidence of at least a doubling of risk of this FEV<sub>1</sub> loss? Evidence suggested that a doubling of risk occurred at cumulative exposures to coal dust of 60-120mg m<sup>-3</sup> yr<sup>-1</sup>.
34. What is the nature of occupational exposure in which this occurs? Data from the Institute of Occupational Medicine in Edinburgh showed exposures to respirable coal dust for UK miners to be:

coal face workers	2.5-6.5 mg m <sup>-3</sup>
development operations	1.5-5.5 mg m <sup>-3</sup>
other underground workers	1.0-3.0 mg m <sup>-3</sup>
surface workers	0.2-0.7 mg m <sup>-3</sup>

35. Can this be translated into job titles and duration of employment for purposes of prescription? On average this translated into 20 years employment underground in a coal mine.

### Conclusions

36. As can be seen from the examples given, since 1946 the Industrial Injuries Scheme has adapted to the changing nature of disease associated with work. The Scheme has been broadened to allow inclusion of diseases of occupational cause, but which are also common in the general population e.g. lung cancer, hearing loss, osteoarthritis of the hip and chronic bronchitis and emphysema. There are mechanisms within the Scheme to enable early recognition, investigation and, where sufficient evidence exists, to prescribe new conditions in a timely fashion, such as recently extrinsic allergic alveolitis due to metal working fluid.

37. An important loss to the Industrial Injuries Scheme was the abolition of Reduced Earnings Allowance in 1990. This was arguably the most enlightened part of the Scheme. It provided an earnings replacement benefit, to enable those with occupational disease, whose health would be adversely affected by remaining in their job, to move to other less well paid work, providing the means to prevent disease progression to a severe and irreversible level of disability.
38. Provision of a benefit with these aims and incentives would seem a worthwhile addition in a reformed scheme.
39. The Industrial Injuries Scheme today faces several challenges. The nature of work continues to change in the UK with less heavy industry, more service workers and more self-employed. The nature of the associated ill health is also changing. The Scheme needs to align more closely with modern social security objectives, in particular, support to enable claimants to remain in, to change or to return to work. Finally the name of the Scheme itself should be changed to reflect its modern purpose.





**Professor David Coggon, OBE, FMed Sci**  
**Speaking on**  
**The Changing Face of Occupational Medicine**

## The Changing Face of Occupational Medicine

**Professor David Coggon, OBE, FMed Sci**

**Past-Chairman of the IAC Research Working Group**

**Clinical Scientist and Professor of Occupational and Environmental Medicine at the MRC Environmental Epidemiology Unit, University of Southampton**

40. The Workmen's Compensation Act of 1906 listed six occupational diseases which were eligible for compensation: anthrax, ankylostomiasis, lead poisoning, mercury poisoning, phosphorus poisoning and arsenic poisoning. Early in the 20<sup>th</sup> century the major occupational diseases were caused by over-exposure or unusual exposure to chemical, physical or biological agents. An effective paradigm for dealing with these diseases was by identifying and characterising the hazard, undertaking a risk assessment, controlling the exposure then checking the effectiveness of the controls. This approach dealt effectively with many early occupational diseases.
41. For example, in the 1950s, Case *et al.* published a seminal research paper describing the association between bladder cancer and the manufacture of certain dyestuffs in the British chemical industry. The study was a retrospective occupational cohort investigation, and served as a prototype for many subsequent studies. The problem of bladder cancer due to dyestuffs was successfully controlled by substitution of the chemicals that were responsible for the hazard.
42. Unfortunately the story of mesothelioma, the rare lung cancer caused by exposure to asbestos, has not had such a successful outcome. Hodgson *et al.* have published data showing that nationally, mortality from mesothelioma continued to increase from the 1970s to 2002 in most age groups, despite earlier controls on exposure. It appears, therefore, either that the controls were inadequate, or that they were inadequately enforced.
43. Furthermore, new occupational diseases continue to come to light, such as the newly prescribed osteoarthritis of the hip in farmers. This prescription was based on research evidence from the UK and elsewhere that has accumulated since the 1980s.
44. Overall, however, we are seeing a decline in traditional occupational diseases due partly to improved risk management, but also to changes in the types of industrial activities undertaken. There has been a switch from employment in blue collar, manufacturing jobs to work predominantly in white collar occupations.
45. With these changes, new occupational health problems have become prominent such as low back pain, 'RSI' (repetitive strain injury) and work-related stress. Recent results from HSE's Labour Force Survey indicate an estimated 452,000 workers nationally with low back pain, 375,000 workers with 'RSI' and over half a million with stress that they believe to have been

caused or made worse by work. The attribution of these illnesses to work depends on self-report, but the statistics still give an indication of the scale of the perceived problem. These types of work-related ill health differ from traditional occupational diseases in that there usually is no demonstrable underlying pathology, and they are subject to important psychological influences. Furthermore, they exhibit striking epidemiological features that cannot be explained by established physical causes in the workplace.

46. Psychological influences have a major effect on occupational ill health. For example, in one study, people with low mood and a somatising tendency (i.e. individuals worried about common physical symptoms such as numbness, indigestion, etc.) were twice as likely to report new low back pain. And in another study, individuals with a pessimistic view that their arm pain would not be better in a year's time were twice as likely to have persistent symptoms at follow-up after 12 months, even after adjustment for the duration of pain and associated disability at baseline.
47. There has been a huge rise in the numbers of people claiming incapacity benefits for low back pain over the last 40 years, which cannot be explained by changes in the nature of work. A study of regional pain in the UK and Mumbai workforce showed that UK Asians and other UK workers had similar prevalence rates of pain in the back, shoulder, elbow and wrist in both manual and non-manual workers. However, workers in Mumbai had much lower rates of regional pain, particularly in the arm, even though they were exposed to similar physical activities in their work. Notably, the manual workers in Mumbai had never heard of 'RSI', and the differences in symptoms may in part reflect cultural differences in health beliefs and concerns.
48. Disease is a disordered state of an organism or organ. Illness is an absence of well-being. One hypothesis is that much of the chronic illness and disability that is currently attributed to injurious occupational exposures does not arise from organic pathology. Rather it is a psychologically mediated response to an external trigger that is conditioned by a combination of individual characteristics and cultural values, beliefs and expectations. If this hypothesis is correct, there are important implications for risk management of chronic illness and disability. For example, controls on exposure may not produce the expected benefits. This is not to say that people are inventing symptoms, rather that there is a genuine illness which is influenced by their beliefs and perceptions.
49. There may also be scope for interventions which are aimed at modifying beliefs and expectations. Buchbinder *et al.* reported that following widespread media publicity in Victoria, Australia to inform the public that people with a bad back should remain active within the limits of their symptoms, the numbers of claims for back pain decreased.
50. The hypothesis also has significant implications for compensation of work-related illnesses such as low back pain and stress. There are no objective diagnostic criteria available for these illnesses, and the hypothesis suggests

that by modifying people's beliefs and expectations, their prescription could cause an unintended increase in illness and disability.



**Mr Hugh Robertson**  
**Speaking on**  
**The Changing Workplace**

## The Changing Workplace and Occupational Illness

**Mr Hugh Robertson**

**IIAC member - representative of employees**

**Chief Health and Safety Officer, Trades Union Congress**

51. There is a belief that manufacturing is in terminal decline, that the workforce is more diverse, there is more mobility in jobs and that work is safer than it was historically. Is this true?

### Winners and losers in the employment sectors

52. Manufacturing has seen declines in the proportion of the total workforce employed in that sector, with a 2 fold reduction in the last 70 years. The agricultural and mining sectors have seen roughly 10 fold reductions in the proportion of the total workforce employed. In the last 150 years there has been a greater than doubled proportion of the workforce employed in the services sector. The construction sector has remained stable for over 150 years (see box below).

<i>Change in rate employed by sector 1841-2001 (%)</i>			
	<b>1841</b>	<b>1931</b>	<b>2001</b>
<b>Agriculture</b>	22	7	2
<b>Construction</b>	6	6	7
<b>Manufacturing</b>	30	28	15
<b>Mining</b>	3.5	6	0.2
<b>Services</b>	30	42	74

53. Between 1978 and 2006 there have been declines in the numbers of people employed in agriculture (51%), manufacturing (56%) and energy (75%), but growths in the numbers of people employed in distribution for hotels and restaurants (37%), in banking (finance and insurance) (49%), public services (112%) and in all services (42%).
54. In 2006, there were almost 27 million people in employment, compared to 1978 when 24 million were employed. More people are employed than ever before. In manufacturing there is the same number of people employed as there were 100 years ago, but the sector has seen steep declines in the last 30 years. Declines in numbers employed have been seen in heavy engineering, agriculture, mining, shipbuilding and textiles. Conversely there has been growth in the following sectors: food manufacturing, banking and insurance, public services, the entertainment industry and in leisure and tourism. Transport, construction and domestic work have remained relatively stable over time.

## Diversity of the workforce

55. There are more women in the workforce than ever before. The rate of women employed in the workforce has risen by 87.1% in the past 50 years. The highest increases in women employed have been seen in the 25-34 year age range. The number of working mothers has increased by 450%. The service industry has seen the biggest increases in the numbers of women employed.
56. The workforce is getting older. By 2010 it is expected that there will be more 55-64 year olds than 20-29 year olds in the workforce. Employment rates of older workers declined in the 70s and 80s, but that trend has now reversed. 72% of men over 50 and 68% of women over 50 are employed, compared with 64% of men and 60% of women in 1994. One in five of the over 50 workforce are self-employed. The over 50s also make up almost half of all incapacity benefits recipients. The new age discrimination legislation is likely to lead to an increase in the numbers of workers who are over 65.
57. A quarter of the working population are part-time, comprising mainly of women and older workers. The proportion of part-time workers has increased considerably since 1971 but has been relatively stable over recent years.
58. There are over 2.5 million black and ethnic minority workers, of whom around 50% are migrants. Many of these workers are 'hidden'. Black and ethnic minority workers constitute a higher proportion of seasonal workers, construction workers and service sector workers.
59. There are 8.5 million disabled people, of which 48% are employed and this proportion is increasing. There is a greater emphasis on reducing the number on social security benefits in forthcoming years.
60. The types of workers in the workforce have also changed. In the past 25 years there has been an increase in the proportion of the workforce that is classified as managers and administrators and a decrease in those classified as craft and skilled workers. The workforce is growing in flexibility with 45% classified as part-time, self-employed or temporary workers. However, job security has not radically altered.
61. According to Cabinet Office projections by 2011 around 13.5% of the UK's workforce will be self-employed with about 30% working part-time. By 2010, 40-50% of management roles will likely be carried out from home. The high number of working hours in the UK is likely to continue over the next 10 years. Claims that the future will be a leisurely society seem likely to be false. By 2010 there may be over 4.5 million small and medium enterprises (SME), up from some 3.7 million today, potentially creating over 2 million new jobs. Most of the 4.5 million SMEs do not exist today. Conversely it is thought that most of today's SMEs will not exist by 2010.
62. By 2011 it is estimated that around 30% of the UK workforce is likely to be employed in the distribution and transport sector; 27.5% in business and

miscellaneous services; around 22% in non-marketed services; 12.5% in manufacturing; 6% in construction and 2% in the primary/utilities sector.

### Implications for health

63. The number of fatal injuries to workers is 212, the lowest ever level. However, there is a huge problem with occupational health, with an estimated 20-30,000 deaths per year attributed to work and 2 million suffering from work-related ill health.
64. Historically, there are no accurate figures for the numbers of workers who suffer occupational ill health. There is no accurate recording system except for certain specific diseases. Occupational diseases may only be recorded once compensation is available. There is a problem with attributing a disease to occupation. For work-related ill health the only consistent data goes back to the 1970s and relates to certain lung diseases. This data shows that between 1974 and 2003 deaths from pneumoconiosis fell whilst deaths from asbestos-related diseases rose. Self-reported occupational ill health statistics have been available since 1990 from the Health and Safety Executive (HSE). These statistics suggest that between 1990 and 2004/5 the prevalence of work-related illness overall fell; the prevalence of musculoskeletal disorders fell; the prevalence of stress-related ill health rose. Currently over 70% of self-reported occupational ill health is accounted for by musculoskeletal disorders and stress-related illness, with respiratory diseases then hearing loss accounting for the rest. The types of work-related ill health reported to doctors are similar to those in the self-reporting occupational health surveys.
65. However, there is a discrepancy between the types of occupational ill health that is being reported and the type of diseases we are compensating for. Occupational deafness, lung disease and vibration white finger make up over three-quarters of all the occupational disease claims under the common law system; stress and upper limb disorders combined make up less than 10% of claims. Occupational deafness, breathing disorders and vibration white finger are the most commonly compensated prescribed diseases under the IIDB Scheme.
66. Compensation schemes traditionally reflect historical rather than current diseases for a number of reasons. Some diseases take decades to develop. The longer a disease has been around the more scientific evidence and data there is to analyse. Cause and effect is often more easy to show with physical agents than with working methods. Attribution of a disease to an occupation is easier with diseases that are rare in the general population. It is easier to remove a disease from the list of prescribed diseases rather than to add a new disease. Noise was only accepted by the courts as a cause of hearing loss in the late 1940s. Stress-related illnesses were only recognised by the courts in 1996, and are not yet recognised as prescribed diseases by the IIDB Scheme.
67. There are problems with the usefulness of the type of data that is available about current occupational ill health. Self-reported surveys will only reflect

people's perceptions and awareness of ill health, which can be influenced by many different factors. Cause and effect can only be shown epidemiologically. There are very few diseases which are only work-related and do not have counterparts in the general population. There is less surveillance of occupational diseases than in the past. Medical reporting schemes rely on people who report to them; some occupational ill health may not be being reported. There are fewer people in the same job for life. Changes in the labour market and technology mean new industries, new processes and new chemicals, the effect of which on the health of workers is not known.

What does this mean?

68. Compensation schemes do not reflect the changing workforce. It is mainly the workers with traditional occupational diseases from our industrial past in mining, shipbuilding and heavy engineering, who are receiving compensation. On the whole, there is only partial compensation, or no compensation at all, for the main causes of long-term illness today. Work-related ill health in new workforce sectors is less likely to receive compensation. There is an in-built discrimination against women in the workforce. Only around 1 in 8 and 1 in 10 workers injured or made ill through work claim compensation. The lack of data makes prevention of work-related illness more difficult. We know that there are major problems in some new industries but there is no cause and effect proof on which to base compensation.
69. What is needed is a new national surveillance scheme. The HSE health agenda and the government's health, work and well being agenda will hopefully address and resolve some of these issues. A review of the IIDB Scheme to enable better compensation of the ill health of today's workers is necessary.



**Professor Mansel Aylward, CB, MD, FRCP, FFPM, FFOM, DDAM**

**Speaking on**

**The Psychosocial Factor in Occupational Disease**

## **Psychosocial Influences on Health in Work**

**Professor Mansel Aylward, CB**

**IIAC member – independent medical expert**

**Director of the UnumProvident Centre for Psychosocial and Disability Research,  
Cardiff University; Chair of the Wales Centre for Health**

70. What do we know about being out of work? We know that unemployment is bad for you. It leads to loss of income, is destructive to self-respect and brings risks of ill health. The “psychosocial scar” of worklessness persists, even affecting future generations. Long term worklessness (i.e. a period of greater than 6 weeks) is one of the greatest known risks to public health. It is equivalent to smoking 10 packs of cigarettes a day. Suicide rates are increased six fold in those who are out of work for a long time. In fact, young men who have been out of work for more than 6 months are forty times more likely to commit suicide than those in work. The health risks and effect on life expectancy are greater than many “killer diseases”. The risks of worklessness are even greater than the most dangerous jobs, such as construction in the North Sea.
71. Work is good for your health and wellbeing. There is strong evidence that work is generally good for physical and mental health and wellbeing. Work reverses the adverse health effects of unemployment. Although the beneficial effects of work depend on the nature and quality of the work and its social context; jobs should be safe and accommodating. Moving off benefits without entry into work is associated with deterioration in health and wellbeing. Sickness and disability are among the main threats to a full and happy life. An incapacity for work has one of the most significant impacts on the individual, the family, the economy and society as a whole.
72. Looking at the social contexts of economic inactivity provides important lessons for occupational health. Lack of autonomy in life is an enduring negative issue which leads to poor health, economic inactivity and unhappiness. Work is central to wellbeing and correlates with happiness. Being disadvantaged is a cumulative process, which can be altered by prioritising the transition to a more advantaged trajectory – “It is never too late, and always good sense, to offer a helping hand”. Illness or disability which impairs work persistently reduces life satisfaction. Understanding and tackling the social determinants of health, disadvantage and economic inactivity are not matters for public health alone, they are equally matters for occupational health.
73. A shift in attitudes to health and work must take place. Currently the perception is that work is a ‘risk’ and potentially harmful to physical and mental health, and that sickness absence and certification ‘protects’ the worker or patient from work. This perception should be shifted to the attitude that work is generally good for physical and mental health and that long term worklessness is a risk and is harmful. Work is healthy and the workplace is an

environment that can be used for promoting health and controlling ill health. This can be done with health, safety and anti-discrimination policies, with occupational health and vocational rehabilitation programmes and effective absence management. Worklessness and highlighting the health promoting effects of work is an important public health issue.

74. Psychosocial determinants and influences have a significant effect on people's perceptions of health, work, and worklessness. Work meets important psychosocial needs in societies where employment is the 'norm'. There is no denying that some aspects of work can be hazardous and pose risks to health. But the powerful social gradient in physical and mental health and mortality outweighs all other characteristics of work that influence health. Job insecurity has an adverse effect on health, as does shift work, whilst flexible schedules have a positive effect on health. There is conflicting evidence about the health effects of working long hours.
75. There have been several approaches to considering "stress" – physiological, engineering and psychological. The physiological approach considers stress as a response to a threat or harm in the environment. The engineering approach sees stress as a stimulus or characteristic of the environment in the form of level of demand (i.e. cognitive mediation). The psychological approach to stress describes stress not as a stimulus or response, but a dynamic process as the individual reacts with the environment. With the psychological approach to stress, there are obvious effects of cognitive or situational factors on performance and wellbeing. This approach also allows for individual differences in the stress process (i.e. personality, gender, coping ability, social contexts).
76. Various research models have been described to assess the psychosocial influences on satisfaction and wellbeing in work. The demand and control model considers workload, decision latitude (job control), task/decision authority (control of work) and skill/intellectual discretion (using skills and competencies) as factors affecting the psychosocial influences to work. High demand with low control causes high strain and harmful outcomes. The demand-control model can predict cardiovascular disease and increased mortality. However, the demand and control model omits the moderating effect of social support. Furthermore, this model has been criticised as it relies too heavily on objective job characteristics and there is a lack of reference to individual differences. This model also fails to explain why some levels of demand and control in different individuals gives rise to different behavioural and health outcomes. The perceptions of the demanding event are not perceived as stressful by all people. This model also ignores emotions.
77. The effort-reward imbalance model allows for a partial role for individual differences as well as the importance of subjective perceptions. If the effort at work and the suitable reward are perceived to be mismatched this generates stress. Rewards can be financial or increased esteem, better career opportunities or increased security. This model allows for individual differences and is not dependent on objective job characteristics. However the

model fails to predict health outcomes such as anxiety, depression or musculoskeletal disorders.

78. There is some evidence that improved psychosocial working conditions enhance health and wellbeing, and reduce sickness absence. However, it is difficult to evaluate the effectiveness of interventions due to i) ongoing structural changes in the labour market (e.g. mergers, downsizing, outsourcing); ii) a lack of meaning to the randomization of individuals, thus requiring large samples to gain meaningful results; iii) employer reluctance; iv) the inadequate evaluation of the scientific foundation and practicality of interventions; and v) the sometimes very short period interventions are undertaken for.
79. Common organisational features associated with economically successful companies and improved employee health parameters are: security of employment, self-managed teams, decentralised decision making, relatively high earnings linked to organisational performance, extensive training, reduced status and barriers, extensive sharing of information.
80. There are many questions still unanswered about work and wellbeing. We need to understand how much work is good for health? How much does unemployment harm health? We need to determine more precisely the physical and psychosocial characteristics of jobs and the workplace that promote health and wellbeing. High quality scientific research is needed to investigate the impact of work on the health of working age adults, to address the cause and effect relationships and to look at the relative balance of adverse versus beneficial effects of different elements of work. There should be longitudinal studies investigating work and wellbeing over a lifetime perspective and comparing those who have retired compared to those who have continued to work.
81. There is an urgent need for rigorous research into work-related “stress”. The basic concepts and definitions need to be agreed. The methods of measurement of work-related stress needs to be assessed. There should be direct studies of cause and effect relationships and research to investigate the relative balance of adverse versus beneficial effects of the psychosocial characteristics of work. The influences and interactions of cultural attitudes, beliefs and social contexts relating to work-related stress also need to be better understood.
82. A lack of autonomy in life and work is an enduring negative leading to poor health, dissatisfaction within work and unhappiness. Work is central to wellbeing and correlates with happiness. Research findings when applied to the workplace are not reducing employees’ perceived levels of stress as effectively as was hoped. Were these interventions not applied at the right time, or in the right way, or were they not targeted at the right people? An ignorance persists about the precise processes of “stress” and how best to evaluate and measure it. Interventions should be aimed at individuals as well as organisations and should allow for differences between individuals and

jobs. Personal responses and perceptions lie at the heart of the problem if the “stress” versus work concept is to be challenged. Successful strategies are likely to depend on sound leadership and support, work culture and organisation, openness and communication. Strategies should aim to achieve balanced effort and rewards, an awareness of job demands and control and to promote the feeling of being valued. Line managers play a key role – they are the prism through which the work climate is perceived by employees.

83. The health promoting workplace is a climate where people are allowed to be well. This can be achieved by positive job design and good line management and should be backed up by proactive rehabilitation and support. The affects of negative affectivity need to be recognised and addressed as they influence the subjective and emotional experience of stress and the negative reactions to life and work stressors. Negative affectivity is a psychosocial determinant of common health problems such as musculoskeletal problems. Treating the symptoms and not the underlying psychosocial causes won't improve the quality of the individual's working life or health in work.

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Further information about IIAC is available from the IIAC Secretariat, 6<sup>th</sup> floor, The Adelphi, 1-11 John Adam Street, London, WC2N 6HT. Telephone: 0207 962 8007. Email: [iiac@dwp.gsi.gov.uk](mailto:iiac@dwp.gsi.gov.uk) Website: [www.iiac.org.uk](http://www.iiac.org.uk)



**Cutting the celebration cake**

**The Chairman, Professor Anthony Newman Taylor flanked  
by some of the members of IIAC**

**[from left to right] Dr Anne Spurgeon, Dr Keith Palmer,  
Professor Mansel Aylward and Dr Janet Asherson**

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