



UK doctors' views on the implementation of the European Working Time Directive as applied to medical practice: a quantitative analysis

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2013-004391
Article Type:	Research
Date Submitted by the Author:	01-Nov-2013
Complete List of Authors:	Maisonneuve, Jenny; University of Oxford, Nuffield Department of Population Health Lambert, Trevor; University of Oxford, Nuffield Department of Population Health Goldacre, Michael; University of Oxford, Nuffield Department of Population Health
Primary Subject Heading:	Medical education and training
Secondary Subject Heading:	Health services research
Keywords:	HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, MEDICAL EDUCATION & TRAINING

SCHOLARONE™
Manuscripts

1
2
3
4
5 **UK doctors' views on the implementation of the European Working Time**
6 **Directive as applied to medical practice: a quantitative analysis**
7
8
9

10
11 Jenny J Maisonneuve, Research officer^a

12 Trevor W Lambert, Statistician^a

13
14 Michael J Goldacre, Professor of public health^a
15
16
17
18

19 ^a UK Medical Careers Research Group, Nuffield Department of Population Health,
20 University of Oxford, Old Road Campus, Headington, Oxford, OX3 7LF
21
22
23

24 **Correspondence to:**

25
26 Trevor Lambert, Unit of Health-Care Epidemiology, Nuffield Department of
27 Population Health, University of Oxford, Rosemary Rue Building, Old Road Campus,
28 Oxford OX7 3LF
29

30
31 Tel: +44 (0) 01865 289389

32
33 Fax: +44 (0) 01865 289379

34
35 Email: trevor.lambert@dph.ox.ac.uk
36
37

38 **Keywords:** European Working Time Directive, United Kingdom, doctor, workforce,
39 medical training
40
41
42

43 **Word count: 2,909**
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

ABSTRACT [247 words]

Objectives To report on doctors' views, from all specialty backgrounds, about the European Working Time Directive (EWTD) and its impact on the NHS, senior doctors, and junior doctors.

Design All medical school graduates from 1999 and 2000 were surveyed by post and email in 2012.

Setting United Kingdom

Methods Among other questions, in a multi-purpose survey about medical careers and career intentions, doctors were asked to respond to three statements about the EWTD on a five-point scale (from strongly agree to strongly disagree): '*The implementation of the EWTD has benefited the NHS*', '*The implementation of the EWTD has benefited senior doctors*', '*The implementation of the EWTD has benefited junior doctors*'.

Results The response rate was 54.4% overall (4,486/8,252), 55.8% (2,256/4,042) of the 1999 cohort and 53.0% (2,230/4,210) of the 2000 cohort. 54.1% (2,427) of all respondents were women. Only 12% (498/4136 doctors) agreed that the EWTD has benefited the NHS, 9% (377) that it has benefited senior doctors, and 31% (1289) that it has benefited junior doctors. Doctors views on EWTD differed significantly by specialty groups: 'craft' specialties like surgery, requiring extensive experience in performing operations, were particularly critical.

Conclusion These cohorts have experience of working in the NHS both before and after the implementation of EWTD. Their lack of support for the EWTD four years after its implementation should be a concern. However, it is unclear whether problems rest with the current ceiling on hours worked or with the ways in which EWTD has been implemented.

ARTICLE SUMMARY

Strengths and limitations of this study

- This study is a systematic survey of all UK medical graduates from 1999 and 2000 willing to reply. These cohorts have extensive experience of work before and after the full implementation of the EWTD in medical practice.
- As with all surveys, non-responder bias is possible. The study represents the subjective views of doctors and does not include any objective impact of the EWTD on the NHS, junior or senior doctors.
- Respondents may have had difficulty in separating the effects of EWTD itself, and the way it has been implemented, from those of other reforms to the NHS and medical training.
- We have no information on various factors, such as hospital size or the nature of rotas and the organisation of shift work, that may have influenced doctors' views.

INTRODUCTION

The European Working Time Regulations (EWTD) mandated the reduction of working hours for doctors in the UK to a maximum of 48 hours per week (averaged over a six month period). Its implementation in the National Health Service (NHS) was phased in over time with partial implementation in 2004 (56 hours) and full implementation in 2009. In addition to limits on working hours, the EWTD sets out rest periods to limit continuous periods of work. The goal in reducing working hours is to promote workers' health and safety by decreasing fatigue among doctors; and thereby to improve patient safety. The EWTD has been enshrined in law as the European Working Time Regulations (EWTR) but, for simplicity and using the commoner phrase, we use the term EWTD throughout.

Considerable controversy has surrounded the EWTD in the NHS. Concerns have been raised by bodies such as NHS Employers.[1] The Royal College of Physicians have expressed concerns that it may have adverse effects on the quality of medical training.[2] The Royal College of Surgeons has commented on reduced time for training and possible patient safety issues.[3] An independent review was commissioned by Medical Education England (MEE) in 2010 to examine the impact of EWTD on the training of health care professionals.[4] Among other recommendations, the review proposed the implementation of a consultant delivered health service to be 'directly responsible for the delivery of 24/7 care' and to 'work more flexibly to deliver high quality training and service'.

As part of a multi-purpose series of surveys of doctors, mainly aimed at obtaining information about their career intentions, we were struck by the number of spontaneous comments doctors made about EWTD.[5] In an accompanying paper we reported results of a qualitative analysis of the comments made in 2010 by doctors who qualified in the cohorts of 1993, 2005 and 2010.[5] The doctors who commented were largely negative about the EWTD. We had not raised EWTD at all in our questionnaires; the doctors wanted to raise it with us. In order to judge whether these were representative views, in our next scheduled surveys in

our programme, surveys of the qualifiers of 1999 and 2000, we added a brief section on the EWTD inviting all doctors to express a view. The aim was to get views from all respondents and not just those who self-selected to volunteer their views. The doctors we surveyed had worked for over a decade after qualification, and had experience of working both before and after the implementation of the EWTD in the NHS. Our objective in this paper is to report on the views of doctors about whether the implementation of the EWTD has benefited the NHS, senior doctors, and junior doctors. We also investigated whether there were differences in views between different specialties and between men and women.

METHODS

All graduates from all medical schools in the UK in 1999 and 2000 were identified from General Medical Council registrations. We have previously surveyed these doctors one, three, five, and seven years after graduation.[6, 7] In 2012, our fifth survey, over a decade after the doctors' graduation, we included questions about the EWTD.

The questionnaire contained the following three statements: *'The implementation of the EWTD has benefited the NHS'*, *'The implementation of the EWTD has benefited senior doctors'*, and *'The implementation of the EWTD has benefited junior doctors'*. Doctors were asked to respond to each statement using a five-point scale from *'strongly agree'* to *'strongly disagree'*. Doctors were also asked a range of questions about their current and previous posts and about their future career intentions. Doctors were sent the questionnaire by post and by email. Several reminders were sent to non-responders. Further details of our methodology are available elsewhere.[8, 9]

We analysed doctors' responses to the questions overall, by specialty group and gender. Specialties were grouped by us as adult hospital medical specialties, paediatrics, emergency medicine, surgery, obstetrics & gynaecology, anaesthetics, radiology, clinical oncology, pathology, psychiatry, general practice, and 'other medical specialties' comprising those in public health and community health. Those unemployed, not working in medicine, or with an

1
2
3 unknown specialty were not included in the analysis by specialty. We used chi-squared tests
4 and adjusted residuals to compare responses by specialty sub-group. Adjusted residuals
5 provide a simple means of identifying specialties in which doctors showed a particularly high
6 or low level of percentage agreement or disagreement with the statements above (also see
7 footnotes to Table 1).
8
9
10
11
12

13 14 RESULTS

15
16 The cohorts of 1999 and 2000 comprised 8,652 medical graduates (4,219 and 4,433,
17 respectively). We excluded from the overall total 279 who were not contactable, 12
18 deceased, and 109 who told us that they did not wish to participate. The response rate was
19 54.4% overall (4,486/8,252), 55.8% (2,256/4,042) of the 1999 cohort and 53.0%
20 (2,230/4,210) of the 2000 cohort. 54.1% (2,427) of all respondents were women. Of the
21 4,486 replies 290 doctors did not respond to the specific questions concerning the effect of
22 EWTD on senior doctors (154 from 1999 and 136 from 2000) and the NHS (152 from 1999
23 and 138 from 2000). 281 did not respond to the question about junior doctors (152 from
24 1999 and 129 from 2000). 60 respondents to the three statements had an unknown
25 specialty, were not working in medicine, or were unemployed.
26
27
28
29
30
31
32
33
34
35
36
37

38 The implementation of the EWTD has benefited the NHS (Table 1)

39
40 Overall, 12.0% (498/4136) agreed that the EWTD had benefited the NHS, 58.9% of doctors
41 (2436/4136) disagreed, and 29.1% (1202/4136) were neutral. The majority of surgeons
42 (75.9%) and of physicians in adult hospital medical specialists (64.7%) disagreed, as did
43 76.5% of specialists in clinical oncology (all four groups had significantly higher levels of
44 disagreement than the all-specialty average, Table 1) Psychiatrists (46.6% disagreement)
45 and GPs (49.2%) were significantly less likely to disagree than the all-specialty average
46 (Table 1).
47
48
49
50
51
52
53
54

55 The implementation of the EWTD has benefited senior doctors (Table 2)

1
2
3 Only 9.1% (377/4,136) agreed that the EWTD had benefited senior doctors. The
4 majority disagreed (63.6%, 2,632/4,136) and 27.2% (1,127/4,136) were neutral. Specialists
5 in clinical oncology (80%), surgery (79%), and the adult medical specialties (69.2%) had
6 significantly high levels of disagreement, while anaesthetics (68.7%) and radiology (68.2%)
7 also showed high levels of disagreement which did not attain statistical significance (perhaps
8 as a result of smaller numbers). Very few surgeons (5.7%, 34/593) agreed with the
9 statement. GPs showed a high level of neutrality, with 36.9% (520/1,410) neither agreeing
10 nor disagreeing with the statement.
11
12

13 **The implementation of the EWTD has benefited junior doctors (Table 3)**

14
15 Respondents were more inclined to agree that EWTD has benefited junior doctors in
16 contrast to how they viewed its impact on seniors and on the wider NHS. A total of 31.1%
17 (1289/4145) agreed with the statement, 21.9% (912/4145) were neutral and 46.9%
18 (1944/4145) disagreed. Surgeons (70%), clinical oncologists (63%) and anaesthetists (55%)
19 showed higher levels of disagreement than average, while GPs (38%), psychiatrists (30%)
20 and specialists in emergency medicine (38%) had lower than average levels of
21 disagreement.
22
23

24 **Men compared to women (Table 4)**

25
26 Women were more inclined than men to express the view that the EWTD has benefited
27 junior doctors (Table 4). Men were more inclined than women to disagree that the
28 implementation of EWTD had benefited the NHS and a higher percentage of women than
29 men held neutral views. Views of men and women about senior doctors and the EWTD did
30 not differ appreciably.
31
32

33 **DISCUSSION**

34 **Main Findings**

1
2
3 The great majority of doctors did not agree that the EWTD has benefited the NHS or senior
4 doctors. Doctors were more positive about its benefits for junior doctors but, even so, fewer
5 than a third felt that the EWTD had benefited junior doctors. The negative views of the
6 EWTD four years after its implementation indicate that it is a continuing concern for doctors.
7
8 There were significant differences between respondents in different specialties. Doctors in
9 the surgical specialties, the hospital physician specialties, anaesthetics and clinical oncology
10 were significantly more negative about the implementation of EWTD than the all-specialty
11 average; doctors in psychiatry and general practice were less negative.
12
13
14
15
16
17
18
19

20 **The impact of the EWTD on junior doctors**

21
22 The impact of working limits has been studied throughout the “roll out” of the EWTD. Some
23 studies examined the effect of a 56 hour limit and others of 48 hours. The literature
24 concerning perceptions and attitudes towards working time restrictions varies in its quality
25 and generalisability.[10] Studies of the surgical specialties typically report surgeons to have
26 a negative view of the EWTD.[11-15] Our findings confirm this. Previous studies of the views
27 of surgical trainees have found concerns about reduced contact time with trainers,[14]
28 reduced clinical exposure and operative experience,[12, 16] and adverse impact on patient
29 care.[11, 12] Our findings indicate that few surgeons believe junior doctors benefit from the
30 EWTD. The surgical specialties, often regarded as craft specialties, require development of
31 proficient manual dexterity and expertise alongside the development of medical and surgical
32 knowledge. Restricting working hours has been argued to lengthen the amount of time it
33 takes to develop this expertise.[17] Another issue has been a potential conflict between
34 junior doctors’ ability to balance training opportunities with service provision within reduced
35 working hours.[18] In 2010 the GMC surveyed trainees and asked if they found it was taking
36 longer to achieve educational competencies as a result of 48 hour restrictions from EWTD
37 (with responses invited of Yes, Unsure, No). They found 51.4% of surgical trainees, 49.3%
38 of trainees in obstetrics and gynaecology, and 47.6% of trainees in anaesthetics believed
39 that it took longer to achieve the required educational competencies.[18] In contrast, 72.5%
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 of trainee GPs, 66.3% in psychiatry, 58.1% in pathology, and 52.7% in emergency medicine
4 believed that EWTD did not limit the achievement of their educational competencies.[18]
5
6

7
8 In the context of the EWTD in 2013, it is worth considering the comments we received from
9 doctors whom we studied in similar ways 20 years ago when junior doctors worked very long
10 hours. For example, we studied the qualifiers of 1993 at the end of their pre-registration year
11 in 1994. We reported our concerns about the fact that many trainees wrote telling us of the
12 adverse impact on them of working very long and intensive hours.[19] As we reported
13 then,[19] “some doctors clearly suffered in the pre-registration year”. Some made vivid
14 comments about fatigue-related stress. We quoted a doctor who wrote “I have been nearly
15 suicidal throughout some of last year”, as a result of exhaustion; and another who wrote
16 “The fact that I haven’t killed anyone through exhaustion leading to medical error is a
17 miracle”. We reported that a formal key word search on such terms as ‘exhaustion’ and
18 ‘fatigue’ showed that 10% of all who replied to our questionnaire (259/2621 doctors) in 1994
19 spontaneously made working-hours-related comments that we considered worrying.
20 Nowadays we do not get many, if any, comments like these, although we get many about
21 “unfairness of unpaid overtime” and not being able to declare non-compliant hours.[5] To
22 illustrate diversity among doctors,[19] we also quoted one who wrote in the very long
23 working hours of 1994: “I am quite happy with my working hours. Further reductions could be
24 detrimental to the level of experience gained from the job”.
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42

43 More recently, we have shown that doctors in their first year of work, graduating from
44 selected cohorts from 1999 to 2009, have reported increasingly high levels of satisfaction, in
45 the more recent cohorts, with time off work for leisure and with enjoyment of their work.[20]
46
47
48
49

50 **The impact of the EWTD on senior doctors**

51
52
53 International research concerning the impact of working time restrictions on senior doctors is
54 limited. Richter et al. (2013) compared burnout among doctors prior to the implementation of
55 EWTD and post implementation in Hamburg, Germany (n=328). While the authors found a
56
57
58
59
60

1
2
3 decrease in working hours after the implementation of EWTD among junior doctors, a similar
4 decline was not found among seniors. Rather, the results indicated greater strain and
5 burnout among senior physicians with less time for rest.[21] Hutter (2006) studied the
6 working hour restriction in the US to 80 hours/week and found a reduction in burnout among
7 junior but not senior doctors.[22] These results are in line with our findings that the majority
8 of our UK respondents did not believe EWTD benefits senior doctors.
9
10

11
12
13
14
15
16 Other research has focused on surveying senior doctors or 'trainers' about their views on
17 how the EWTD has impacted on medical training. Tsourfouli (2008) held qualitative
18 interviews with 20 consultants, from surgical and medical specialties, who train junior doctors
19 across six trusts in Wales in 2005.[23]. These trainers considered that there was a
20 disintegration of the apprenticeship style of learning in clinical training following the
21 implementation of the EWTD and the increased use of shift work. Respondents commented
22 on "the reduced availability of trainees, reduced interaction between trainees and trainers,
23 and reduced continuity" among effects of the implementation of the EWTD.[23] Doctors also
24 commented on the new roles and increased workload of consultant trainers as a result of
25 MMC.[23] A GMC survey of trainers (n=17,000) conducted between 2009 and 2010 found
26 that 58% believed that the training needs of their trainees were being met within the 48 hour
27 work week. However, 74.3% of trainers from the surgical specialties did not believe their
28 trainees needs were being met.[18] The GMC report in 2010 identified particular specialties
29 as having consistent concerns related to EWTD's effect on training opportunities, namely,
30 surgical specialties, obstetrics and gynaecology, emergency medicine, anaesthetics, and
31 paediatrics.[18] The GMC survey found that 49% of trainers indicated that they have
32 changed the way they teach trainees as a result of EWTD.[18] Just as junior doctors must
33 adapt their learning strategy within limited working hours, a culture shift from senior doctors
34 might be necessary to meet the evolving demands of medical training.
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53

54
55
56 A systematic review of the literature reported inconclusive findings on the effects of
57 EWTD.[24] In fact, it is challenging to differentiate the changes resulting from EWTD in
58
59
60

1
2
3 isolation from those that may have resulted from other changes, including Modernising
4 Medical Careers, The New Deal, or wider structural reforms to the NHS.[25] Importantly, it is
5 difficult to differentiate between the effects of EWTD itself and the ways that Trusts and
6 Deaneries have implemented it.[4] For example, a GMC analysis of Annual Deanery Reports
7 from 2009 found that a few deaneries reported gaps in rotas which they felt were due to
8 EWTD. However, others reported compliance (though whether their juniors would invariably
9 agree may be open to question) and successful implementation of EWTD.[18]
10
11
12
13
14
15
16

17 18 **Strengths and Limitations** 19

20
21 This study is based on large numbers of respondents from across the UK. It covers all
22 doctors who graduated from all UK medical schools in two years, 1999 and 2000. It is a
23 systematic survey of all who were willing to respond in cohorts that have extensive
24 experience of work before and after the full implementation of the EWTD in medical practice.
25 As with all surveys, non-responder bias is possible. We included the section about the
26 EWTD in a multi-purpose survey with several other sections. We did not deem it possible to
27 delve in detail into the doctors' views about the EWTD: in our core work, we try to be thrifty
28 with questions to encourage doctors to respond.
29
30
31
32
33
34
35
36

37
38 The study represents the subjective views of doctors in these cohorts and does not include
39 any objective impact of the EWTD on the NHS, junior or senior doctors. Some caution is
40 advised in interpreting the results as respondents may have had difficulty in separating the
41 effects of EWTD itself, and the way it has been implemented, from those of other reforms to
42 the NHS and medical training. In addition, we did not have information on various factors
43 that may have influenced the findings, such as hospital size or the nature of rotations and
44 the organisation of shift work. For example, it has been suggested that surgical trainees
45 working in large hospitals, with larger volumes of operations, might be less dissatisfied with
46 the EWTD since these trainees have not been so limited in their operating experience.[26] A
47 further limitation is that our questioning, necessarily brief for practical reasons, aimed to seek
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 views on benefit; for those who disagreed that the EWTD had shown benefit, particularly in
4
5 respect of senior doctors, we do not know whether they thought that the effect of EWTD had
6
7 been damaging or simply neutral. It is striking, nonetheless, that only such a small proportion
8
9 felt able to specify that the EWTD had positive benefit.
10

11 **CONCLUSION**

12
13
14 The majority of doctors graduating from medical school in 1999 and 2000 did not agree that
15
16 the EWTD, as implemented in their experience, had benefited the NHS or senior doctors.
17
18 They were less negative about the impact of EWTD on junior doctors. We do not
19
20 recommend, and nor did our respondents advocate, a return to the very long working hours
21
22 of earlier times. However, there is a need for organisational changes, including well-
23
24 coordinated and planned rotas, with consideration of points made by doctors in the
25
26 accompanying paper,[5] to improve opportunities for training and clinical experience while
27
28 maintaining the requirement and the benefit of EWTD-compliant hours.
29
30
31
32
33

34
35 **Acknowledgements:** We would like to thank Emma Ayres for administering the surveys,
36
37 and Janet Justice and Alison Stockford for data entry. We are very grateful to all the doctors
38
39 who participated in the surveys. This is an independent report commissioned and funded by
40
41 the Policy Research Programme in the Department of Health. The views expressed are not
42
43 necessarily those of the Department. The Department of Health had no involvement in the
44
45 study design, collection, analysis and interpretation of the data, in the writing of the article, or
46
47 in the decision to submit it for publication.
48

49
50 **Ethical approval:** This study was approved by the National Research Ethics Service,
51
52 following referral to the Brighton and Mid-Sussex Research Ethics Committee in its role as a
53
54 multi-centre research ethics committee (ref 04/Q1907/48).
55

56
57 **Competing interests:** All authors declare no competing interests.
58
59
60

Funding: This is an independent report commissioned and funded by the Policy Research Programme in the Department of Health (grant reference 016/0116). The views expressed are not necessarily those of the Department.

Author's contribution MJG and TWL designed the study. JJM and TWL undertook the analysis and JJM wrote the first draft. All authors contributed to further drafts and all agreed to the final manuscript.

Data sharing The authors may be able to provide aggregated data on which the analysis is based, on request.

REFERENCES

1. NHS Employers. *European Working Time Directive*. 2011.
<http://www.nhsemployers.org/PlanningYourWorkforce/MedicalWorkforce/EWTD/Pages/EWTD.aspx> (accessed 3 September 2013).
2. Royal College of Physicians. *The European Working Time Directive and working hours*.
<http://www.rcplondon.ac.uk/policy/physician-development/ewtd> (accessed 3 September 2013).
3. Royal College of Surgeons. *Surgeons, the European working time directive and August 1st 2009*. 2009. <http://www.rcseng.ac.uk/news/surgeons-the-european-working-time-directive-and-august-1st-2009#.Ud51DG0U3Zg> (accessed 3 September 2013).
4. Temple J. NHS: Medical Education England, London *Time for training. A review of the impact of the European Working Time Directive on the quality of training*. 2010.
<http://www.mee.nhs.uk/PDF/14274%20Bookmark%20Web%20Version.pdf> (accessed 3 September 2013).
5. Clarke RT, Pitcher A, Lambert TW, Goldacre MJ. Doctors' views on the implementation of the European Working Time Directive: a qualitative analysis. *Unpublished: submitted to BMJ Open for consideration*.

6. Goldacre MJ, Turner G, Lambert TW. Variation by medical school in career choices of UK graduates of 1999 and 2000. *Med Educ* 2004;**38**:249–58.
7. Evans J, Lee P, Goldacre MJ, Lambert TW. Pre-registration house officers' comments on working in the NHS: a qualitative study of the views of UK medical graduates of 1999. *Med Teach* 2004;**26**:250-5.
8. Lambert TW, Goldacre MJ, Edwards C, Parkhouse J. Career preferences of doctors who qualified in the United Kingdom in 1993 compared with those of doctors qualifying in 1974, 1977, 1980, and 1983. *BMJ* 1996;**313**:19–24.
9. Goldacre MJ, Davidson JM, Lambert TW. Career choices at the end of the pre-registration year of doctors who qualified in the united kingdom in 1996. *Med Educ* 1999;**33**:882–9.
10. Morrow G, Burford B, Carter M, Illing J. Durham University: Centre for Medical Education Research. *The impact of the working time regulations on medical education and training: literature review*. 2012. http://www.gmc-uk.org/The_Impact_of_the_Working_Time_Regulations_on_Medical_Education_and_Training__Literature_Review.pdf_51155615.pdf (accessed 3 September 2013).
11. Kelly BD, Curtin PD, Corcoran M. The effects of the European Working Time Directive on surgical training: the basic surgical trainee's perspective. *Ir J Med Sci* 2011;**180**:435–7.
12. Tait MJ, Fellows GA, Pushpanathan S, *et al*. Current neurosurgical trainees' perception of the European Working Time Directive and shift work. *British J Neurosurg* 2008;**22**:28–31.
13. West D, Codispoti M, Graham T. The European Working Time Directive and training in cardiothoracic surgery in the United Kingdom: A report of the Specialty Advisory Board in Cardiothoracic Surgery of The Royal College of Surgeons of Edinburgh. *Surgeon* 2007;**5**:81–5.
14. Lowry J, Cripps J. Results of the online EWTD trainee survey. *B R Coll Surg Engl* 2005;**87**:86–7.
15. Skipworth RJ, Terrace JD, Fulton LA, Anderson DN. Basic surgical training in the era of the European Working Time Directive: what are the problems and solutions? *Scott Med J* 2008;**53**:18–21.

- 1
2
3 16. Parsons BA, Blencowe NS, Hollowood AD, Grant JR. Surgical training: the impact of changes
4 in curriculum and experience. *J Surg Educ* 2011;**68**:44–51.
5
6
7 17. Jackson GP, Tarpley JL. How long does it take to train a surgeon? *BMJ* 2009;**339**:b4260.
8
9 18. General Medical Council (GMC). *GMC quality assurance of specialty including GP training*
10 *and the European Working Time Regulations: September to June 2010*. 2010.
11
12 [http://www.gmc-](http://www.gmc-uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sept_2009_to_June_2010_35872744.pdf)
13 [uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sep](http://www.gmc-uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sept_2009_to_June_2010_35872744.pdf)
14 [t_2009_to_June_2010_35872744.pdf](http://www.gmc-uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sept_2009_to_June_2010_35872744.pdf) (accessed 3 September 2013).
15
16
17
18
19
20 19. Goldacre MJ, Stear S, Lambert TW. Session 3: The pre-registration year: The trainees'
21 experience. *Med Educ* 1997;**31**:57–60.
22
23
24 20. Lambert TW, Surman G, Goldacre MJ. Views of UK-trained medical graduates of 1999–2009
25 about their first postgraduate year of training: national surveys. *BMJ Open* 2013;**3**:
26
27
28 21. Richter A, Kostova P, Baur X, Wegner R. Less work: more burnout? A comparison of working
29 conditions and the risk of burnout by German physicians before and after the
30 implementation of the EU Working Time Directive. *Int Arch Occup Environ Health* Published
31 online First: 20 February 2013. doi:10.1007/s00420-013-0849-x
32
33
34
35
36
37 22. Hutter MM, Kellogg KC, Ferguson CM, Abbott WM, Warshaw AL. The impact of the 80-hour
38 resident workweek on surgical residents and attending surgeons. *Ann Surg* 2006;**243**:864–
39 71.
40
41
42
43 23. Tsouroufli M, Payne H. Consultant medical trainers, modernising medical careers (MMC) and
44 the European time directive (EWTD): Tensions and challenges in a changing medical
45 education context. *BMC Med Educ* 2008;**8**:31.
46
47
48
49
50 24. Moonesinghe SR, Lowery J, Shahi N, Millen A, Beard JD. Impact of reduction in working
51 hours for doctors in training on postgraduate medical education and patients' outcomes:
52 systematic review. *British Medical Journal* 2011;**342**:d1580.
53
54
55
56
57
58
59
60

- 1
2
3 25. General Medical Council (GMC). *The impact of the implementation of the European Working*
4
5 *Time Directive (EWTD)*. 2011. <http://www.gmc->
6
7 [uk.org/The_impact_of_the_implementation_of_the_European_Working_Time_Directive__E](http://www.gmc-uk.org/The_impact_of_the_implementation_of_the_European_Working_Time_Directive__E)
8
9 [WTD__42536543.pdf](http://www.gmc-uk.org/The_impact_of_the_implementation_of_the_European_Working_Time_Directive__E) (accessed 3 September 2013).
10
11
12 26. West D. European Working Time Directive implementation and cardiothoracic training:
13
14 larger centers may optimise training. *Eur J Cardio-Thoracic Surgery* 2007;**31**:958.
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 1: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited the NHS

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	73	9.9*	188	25.4*	479	64.7**	740
Paediatrics	36	17.8**	57	28.2	109	54.0	202
Emergency Medicine	22	15.1	41	28.1	83	56.8	146
Surgery	47	7.9**	96	16.2**	451	75.9**	594
Obstetrics & Gynaecology	5	8.9	12	21.4	39	69.6	56
Anaesthetics	50	14.5	72	20.9**	223	64.6*	345
Radiology	19	12.6	42	27.8	90	59.6	151
Clinical oncology	3	3.7*	16	19.8	62	76.5**	81
Pathology	13	10.3	38	30.2	75	59.5	126
Psychiatry	46	19.7**	79	33.8	109	46.6**	234
General Practice	176	12.5	541	38.3**	695	49.2**	1412
Other Medical	8	16.3	20	40.8	21	42.9	49
χ^2_{11} , p-value	42.6	<0.001	133.7	<0.001	176.1	<0.001	
Total	498	12.0	1202	29.1	2436	58.9	4136

The row of χ^2_{11} values and corresponding p-values indicates whether the variation in percentages, comparing specialties in each column, can be regarded as random. $P < 0.001$ indicates a probability of less than 1 in 1000 that the variation is due to chance.

Asterisks alongside percentages indicate specialties in which doctors take a significantly different view than doctors overall; * denotes $p < 0.05$ and ** $p < 0.01$, representing respectively a 5% and a 1% chance that the specialty variation from the overall average is due to chance.

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 2: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited senior doctors

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	52	7.0	177	23.8*	514	69.2**	743
Paediatrics	23	11.4*	47	23.3	132	65.3	202
Emergency Medicine	22	15.0*	35	23.8	90	61.2	147
Surgery	34	5.7**	89	15.0**	470	79.3**	593
Obstetrics & Gynaecology	5	8.9	9	16.1	42	75.0	56
Anaesthetics	34	9.9	74	21.4*	237	68.7*	345
Radiology	14	9.3	34	22.5	103	68.2	151
Clinical oncology	3	3.8	13	16.3*	64	80.0**	80
Pathology	5	4.0*	38	30.2	83	65.9	126
Psychiatry	37	15.8**	72	30.8	125	53.4**	234
General Practice	142	10.1	520	36.9**	748	53.0**	1410
Other Medical	6	12.2	19	38.8	24*	49.0	49
χ^2_{11} , p-value	41.4	<0.001	138.9	<0.001	174.3	<0.001	
Total	377	9.1	1127	27.2	2632	63.6	4136

See notes to Table 1 for explanation of statistical terminology (χ^2_{11} , p-values and asterisks).

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 3: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited junior doctors

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	219	29.4	178	23.9	347	46.6	744
Paediatrics	74	36.6	43	21.3	85	42.1	202
Emergency Medicine	62	42.5**	29	19.9*	55	37.7*	146
Surgery	109	18.4**	70	11.8**	415	69.9**	594
Obstetrics & Gynaecology	18	32.1	8	14.3	30	53.6	56
Anaesthetics	101	29.3	55	15.9**	189	54.8**	345
Radiology	47	30.9	26	17.1	79	52.0	152
Clinical oncology	15	18.5*	15	18.5	51	63.0**	81
Pathology	37	29.4	21	16.7	68	54.0	126
Psychiatry	110	46.8**	55	23.4	70	29.8**	235
General Practice	480	33.9**	397	28.1**	537	38.0**	1414
Other Medical	17	34.0	15	30.0	18	36.0	50
χ^2_{11} , p-value	97.0	<0.001	84.8	<0.001	230.0	<0.001	
Total	1289	31.1	912	22.0	1944	46.9	4145

See notes to Table 1 for explanation of statistical terminology (χ^2_{11} , p-values and asterisks).

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 4: Doctors views about the implementation of the European Working Time Regulations, comparing the views of men and women

The implementation of the EWTD:	Men		Women		Total	
	n	%	n	%	n	%
Has benefited the NHS¹						
Strongly agree/agree	242	12.3	263	11.8	505	12.0
Neither agree nor disagree	491	25.0	728	32.6	1219	29.1
Strongly disagree/Disagree	1228	62.6	1244	55.7	2472	58.9
Total	1961	100	2235	100	4196	100
Has benefited senior doctors²						
Strongly agree/agree	192	9.8	190	8.5	382	9.1
Neither agree nor disagree	515	26.2	632	28.3	1147	27.3
Strongly disagree/Disagree	1255	64.0	1412	63.2	2667	63.6
Total	1962	100	2234	100	4196	100
Has benefited junior doctors³						
Strongly agree/agree	543	27.6	768	34.3	1311	31.2
Neutral	399	20.3	522	23.3	921	21.9
Strongly disagree/disagree	1024	52.1	949	42.4	1973	46.9
Total	1966	100	2239	100	4205	100

Results of χ^2_2 test for trend across the 3 categories of response, comparing men and women's responses:

¹ $\chi^2_2 = 29.3$, $p < 0.001$

² $\chi^2_2 = 3.5$, $p = 0.17$

³ $\chi^2_2 = 40.3$, $p < 0.001$

Results include 60 doctors with an unknown specialty, were unemployed, or not working in medicine.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

BMJ Open: first published as 10.1136/bmjopen-2013-004391 on 6 February 2014. Downloaded from <http://bmjopen.bmj.com/> on April 19, 2024 by guest. Protected by copyright.

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cohort studies*

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	4-5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	5
		(b) For matched studies, give matching criteria and number of exposed and unexposed	n/a
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5
Bias	9	Describe any efforts to address potential sources of bias	10-limitations
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	n/a
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	5
		(b) Describe any methods used to examine subgroups and interactions	5
		(c) Explain how missing data were addressed	n/a
		(d) If applicable, explain how loss to follow-up was addressed	5
		(e) Describe any sensitivity analyses	n/a
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6
		(b) Give reasons for non-participation at each stage	6
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6
		(b) Indicate number of participants with missing data for each variable of interest	12-13
		(c) Summarise follow-up time (eg, average and total amount)	5
Outcome data	15*	Report numbers of outcome events or summary measures over time	n/a
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
		(b) Report category boundaries when continuous variables were categorized	n/a
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6-7
Discussion			
Key results	18	Summarise key results with reference to study objectives	7
Limitations			
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	7-10
Generalisability	21	Discuss the generalisability (external validity) of the study results	10
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	11

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.



UK doctors' views on the implementation of the European Working Time Directive as applied to medical practice: a quantitative analysis

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2013-004391.R1
Article Type:	Research
Date Submitted by the Author:	13-Dec-2013
Complete List of Authors:	Maisonneuve, Jenny; University of Oxford, Nuffield Department of Population Health Lambert, Trevor; University of Oxford, Nuffield Department of Population Health Goldacre, Michael; University of Oxford, Nuffield Department of Population Health
Primary Subject Heading:	Medical education and training
Secondary Subject Heading:	Health services research
Keywords:	HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, MEDICAL EDUCATION & TRAINING

SCHOLARONE™
Manuscripts

1
2
3
4
5 **UK doctors' views on the implementation of the European Working Time**
6 **Directive as applied to medical practice: a quantitative analysis**
7
8
9

10
11 Jenny J Maisonneuve, Research officer^a

12 Trevor W Lambert, Statistician^a

13
14 Michael J Goldacre, Professor of public health^a
15
16
17
18

19 ^a UK Medical Careers Research Group, Nuffield Department of Population Health,
20 University of Oxford, Old Road Campus, Headington, Oxford, OX3 7LF
21
22
23

24 **Correspondence to:**

25
26 Trevor Lambert, Unit of Health-Care Epidemiology, Nuffield Department of
27 Population Health, University of Oxford, Rosemary Rue Building, Old Road Campus,
28 Oxford OX7 3LF
29

30
31 Tel: +44 (0) 01865 289389

32
33 Fax: +44 (0) 01865 289379

34
35 Email: trevor.lambert@dph.ox.ac.uk
36
37

38 **Keywords:** European Working Time Directive, United Kingdom, doctor, workforce,
39 medical training
40
41
42

43 **Word count: 2,909**
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

ABSTRACT [247 words]

Objectives To report on doctors' views, from all specialty backgrounds, about the European Working Time Directive (EWTD) and its impact on the NHS, senior doctors, and junior doctors.

Design All medical school graduates from 1999 and 2000 were surveyed by post and email in 2012.

Setting United Kingdom

Methods Among other questions, in a multi-purpose survey about medical careers and career intentions, doctors were asked to respond to three statements about the EWTD on a five-point scale (from strongly agree to strongly disagree): '*The implementation of the EWTD has benefited the NHS*', '*The implementation of the EWTD has benefited senior doctors*', '*The implementation of the EWTD has benefited junior doctors*'.

Results The response rate was 54.4% overall (4,486/8,252), 55.8% (2,256/4,042) of the 1999 cohort and 53.0% (2,230/4,210) of the 2000 cohort. 54.1% (2,427) of all respondents were women. Only 12% (498/4136 doctors) agreed that the EWTD has benefited the NHS, 9% (377) that it has benefited senior doctors, and 31% (1289) that it has benefited junior doctors. Doctors views on EWTD differed significantly by specialty groups: 'craft' specialties like surgery, requiring extensive experience in performing operations, were particularly critical.

Conclusion These cohorts have experience of working in the NHS both before and after the implementation of EWTD. Their lack of support for the EWTD four years after its implementation should be a concern. However, it is unclear whether problems rest with the current ceiling on hours worked or with the ways in which EWTD has been implemented.

ARTICLE SUMMARY

Strengths and limitations of this study

- This study is a systematic survey of all UK medical graduates from 1999 and 2000 willing to reply. These cohorts have extensive experience of work before and after the full implementation of the EWTD in medical practice.
- As with all surveys, non-responder bias is possible. The study represents the subjective views of doctors and does not include any objective impact of the EWTD on the NHS, junior or senior doctors.
- Respondents may have had difficulty in separating the effects of EWTD itself, and the way it has been implemented, from those of other reforms to the NHS and medical training.
- We have no information on various factors, such as hospital size or the nature of rotas and the organisation of shift work, that may have influenced doctors' views.

INTRODUCTION

The European Working Time Regulations (EWTD) mandated the reduction of working hours for doctors in the UK to a maximum of 48 hours per week (averaged over a six month period). Its implementation in the National Health Service (NHS) was phased in over time with partial implementation in 2004 (56 hours) and full implementation in 2009. In addition to limits on working hours, the EWTD sets out rest periods to limit continuous periods of work. The goal in reducing working hours is to promote workers' health and safety by decreasing fatigue among doctors; and thereby to improve patient safety. The EWTD has been enshrined in law as the European Working Time Regulations (EWTR) but, for simplicity and using the commoner phrase, we use the term EWTD throughout.

Considerable controversy has surrounded the EWTD in the NHS. Concerns have been raised by bodies such as NHS Employers.[1] The Royal College of Physicians have expressed concerns that it may have adverse effects on the quality of medical training.[2] The Royal College of Surgeons has commented on reduced time for training and possible patient safety issues.[3] An independent review was commissioned by Medical Education England (MEE) in 2010 to examine the impact of EWTD on the training of health care professionals.[4] Among other recommendations, the review proposed the implementation of a consultant delivered health service to be 'directly responsible for the delivery of 24/7 care' and to 'work more flexibly to deliver high quality training and service'.

As part of a multi-purpose series of surveys of doctors, mainly aimed at obtaining information about their career intentions, we were struck by the number of spontaneous comments doctors made about EWTD.[5] In an accompanying paper we reported results of a qualitative analysis of the comments made in 2010 by doctors who qualified in the cohorts of 1993, 2005 and 2010.[5] The doctors who commented were largely negative about the EWTD. We had not raised EWTD at all in our questionnaires; the doctors wanted to raise it with us. In order to judge whether these were representative views, in our next scheduled surveys in

our programme, surveys of the qualifiers of 1999 and 2000, we added a brief section on the EWTD inviting all doctors to express a view. The aim was to get views from all respondents and not just those who self-selected to volunteer their views. The doctors we surveyed had worked for over a decade after qualification, and had experience of working both before and after the implementation of the EWTD in the NHS. Our objective in this paper is to report on the views of doctors about whether the implementation of the EWTD has benefited the NHS, senior doctors, and junior doctors. We also investigated whether there were differences in views between different specialties and between men and women.

METHODS

All graduates from all medical schools in the UK in 1999 and 2000 were identified from General Medical Council registrations. We have previously surveyed these doctors one, three, five, and seven years after graduation.[6, 7] In 2012, our fifth survey, over a decade after the doctors' graduation, we included questions about the EWTD.

The questionnaire contained the following three statements: *'The implementation of the EWTD has benefited the NHS'*, *'The implementation of the EWTD has benefited senior doctors'*, and *'The implementation of the EWTD has benefited junior doctors'*. Doctors were asked to respond to each statement using a five-point scale from *'strongly agree'* to *'strongly disagree'*. Doctors were also asked a range of questions about their current and previous posts and about their future career intentions. Doctors were sent the questionnaire by post and by email. Several reminders were sent to non-responders. Further details of our methodology are available elsewhere.[8, 9]

We analysed doctors' responses to the questions overall, by specialty group and gender. Specialties were grouped by us as adult hospital medical specialties, paediatrics, emergency medicine, surgery, obstetrics & gynaecology, anaesthetics, radiology, clinical oncology, pathology, psychiatry, general practice, and 'other medical specialties' comprising those in public health and community health. Those unemployed, not working in medicine, or with an

1
2
3 unknown specialty were not included in the analysis by specialty. We used chi-squared tests
4 and adjusted residuals to compare responses by specialty sub-group. Adjusted residuals
5 provide a simple means of identifying specialties in which doctors showed a particularly high
6 or low level of percentage agreement or disagreement with the statements above (also see
7 footnotes to Table 1).
8
9
10
11
12

13 14 **RESULTS**

15
16 The cohorts of 1999 and 2000 comprised 8,652 medical graduates (4,219 and 4,433,
17 respectively). We excluded from the overall total 279 who were not contactable, 12
18 deceased, and 109 who told us that they did not wish to participate. The response rate was
19 54.4% overall (4,486/8,252), 55.8% (2,256/4,042) of the 1999 cohort and 53.0%
20 (2,230/4,210) of the 2000 cohort. 54.1% (2,427) of all respondents were women. Of the
21 4,486 replies 290 doctors did not respond to the specific questions concerning the effect of
22 EWTD on senior doctors (154 from 1999 and 136 from 2000) and the NHS (152 from 1999
23 and 138 from 2000). 281 did not respond to the question about junior doctors (152 from
24 1999 and 129 from 2000). 60 respondents to the three statements had an unknown
25 specialty, were not working in medicine, or were unemployed.
26
27
28
29
30
31
32
33
34
35
36
37

38 **The implementation of the EWTD has benefited the NHS (Table 1)**

39
40 Overall, 12.0% (498/4136) agreed that the EWTD had benefited the NHS, 58.9% of doctors
41 (2436/4136) disagreed, and 29.1% (1202/4136) were neutral. The majority of surgeons
42 (75.9%) and of physicians in adult hospital medical specialists (64.7%) disagreed, as did
43 76.5% of specialists in clinical oncology (all four groups had significantly higher levels of
44 disagreement than the all-specialty average, Table 1) Psychiatrists (46.6% disagreement)
45 and GPs (49.2%) were significantly less likely to disagree than the all-specialty average
46 (Table 1).
47
48
49
50
51
52
53
54

55 **The implementation of the EWTD has benefited senior doctors (Table 2)**

1
2
3 Only 9.1% (377/4,136) agreed that the EWTD had benefited senior doctors. The majority
4 disagreed (63.6%, 2,632/4,136) and 27.2% (1,127/4,136) were neutral. Specialists in clinical
5 oncology (80%), surgery (79%), and the adult medical specialties (69.2%) had significantly
6 high levels of disagreement, while anaesthetics (68.7%) and radiology (68.2%) also showed
7 high levels of disagreement which did not attain statistical significance (perhaps as a result
8 of smaller numbers). Very few surgeons (5.7%, 34/593) agreed with the statement. GPs
9 showed a high level of neutrality, with 36.9% (520/1,410) neither agreeing nor disagreeing
10 with the statement.
11
12

13 **The implementation of the EWTD has benefited junior doctors (Table 3)**

14
15 Respondents were more inclined to agree that EWTD has benefited junior doctors in
16 contrast to how they viewed its impact on seniors and on the wider NHS. A total of 31.1%
17 (1289/4145) agreed with the statement, 21.9% (912/4145) were neutral and 46.9%
18 (1944/4145) disagreed. Surgeons (70%), clinical oncologists (63%) and anaesthetists (55%)
19 showed higher levels of disagreement than average, while GPs (38%), psychiatrists (30%)
20 and specialists in emergency medicine (38%) had lower than average levels of
21 disagreement.
22
23

24 **Men compared to women (Table 4)**

25
26 Women were more inclined than men to express the view that the EWTD has benefited
27 junior doctors (Table 4). Men were more inclined than women to disagree that the
28 implementation of EWTD had benefited the NHS and a higher percentage of women than
29 men held neutral views. Views of men and women about senior doctors and the EWTD did
30 not differ appreciably.
31
32

33 **DISCUSSION**

34 **Main Findings**

1
2
3 The great majority of doctors did not agree that the EWTD has benefited the NHS or senior
4 doctors. Doctors were more positive about its benefits for junior doctors but, even so, fewer
5 than a third felt that the EWTD had benefited junior doctors. The negative views of the
6 EWTD four years after its implementation indicate that it is a continuing concern for doctors.
7
8 There were significant differences between respondents in different specialties. Doctors in
9 the surgical specialties, the hospital physician specialties, anaesthetics and clinical oncology
10 were significantly more negative about the implementation of EWTD than the all-specialty
11 average; doctors in psychiatry and general practice were less negative. Gender differences
12 in views were modest. Men were, however, rather more negative about the effects of
13 implementing EWTD in respect of the NHS overall and of the effects on junior doctors, than
14 were women, though the views of the effects on senior doctors were equally negative for
15 both genders.
16
17
18
19
20
21
22
23
24
25
26

27 28 **The impact of the EWTD on junior doctors** 29

30
31 The impact of working limits has been studied throughout the “roll out” of the EWTD. Some
32 studies examined the effect of a 56 hour limit and others of 48 hours. The literature
33 concerning perceptions and attitudes towards working time restrictions varies in its quality
34 and generalisability.[10] Studies of the surgical specialties typically report surgeons to have
35 a negative view of the EWTD.[11-15] Our findings confirm this. Previous studies of the views
36 of surgical trainees have found concerns about reduced contact time with trainers,[14]
37 reduced clinical exposure and operative experience,[12, 16] and adverse impact on patient
38 care.[11, 12] Our findings indicate that few surgeons believe junior doctors benefit from the
39 EWTD. The surgical specialties, often regarded as craft specialties, require development of
40 proficient manual dexterity and expertise alongside the development of medical and surgical
41 knowledge. Restricting working hours has been argued to lengthen the amount of time it
42 takes to develop this expertise.[17] Another issue has been a potential conflict between
43 junior doctors' ability to balance training opportunities with service provision within reduced
44 working hours.[18] In 2010 the GMC surveyed trainees and asked if they found it was taking
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 longer to achieve educational competencies as a result of 48 hour restrictions from EWTD
4 (with responses invited of Yes, Unsure, No). They found 51.4% of surgical trainees, 49.3%
5 of trainees in obstetrics and gynaecology, and 47.6% of trainees in anaesthetics believed
6 that it took longer to achieve the required educational competencies.[18] In contrast, 72.5%
7 of trainee GPs, 66.3% in psychiatry, 58.1% in pathology, and 52.7% in emergency medicine
8 believed that EWTD did not limit the achievement of their educational competencies.[18]
9

10
11 In the context of the EWTD in 2013, it is worth considering the comments we received from
12 doctors whom we studied in similar ways 20 years ago when junior doctors worked very long
13 hours. For example, we studied the qualifiers of 1993 at the end of their pre-registration year
14 in 1994. We reported our concerns about the fact that many trainees wrote telling us of the
15 adverse impact on them of working very long and intensive hours.[19] As we reported
16 then,[19] “some doctors clearly suffered in the pre-registration year”. Some made vivid
17 comments about fatigue-related stress. We quoted a doctor who wrote “I have been nearly
18 suicidal throughout some of last year”, as a result of exhaustion; and another who wrote
19 “The fact that I haven’t killed anyone through exhaustion leading to medical error is a
20 miracle”. We reported that a formal key word search on such terms as ‘exhaustion’ and
21 ‘fatigue’ showed that 10% of all who replied to our questionnaire (259/2621 doctors) in 1994
22 spontaneously made working-hours-related comments that we considered worrying.
23 Nowadays we get many fewer comments like these: in our recent study of the 2012
24 graduates in 2013, we found only 2 doctors of 2419 respondents mentioned work-related
25 ‘exhaustion’ or ‘fatigue’ or ‘tiredness’, although ‘stress’ was mentioned by 43 and we get
26 many comments about “unfairness of unpaid overtime” and not being able to declare non-
27 compliant hours.[5] To illustrate diversity among doctors,[19] we also quoted one who wrote
28 in the very long working hours of 1994: “I am quite happy with my working hours. Further
29 reductions could be detrimental to the level of experience gained from the job”.
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 More recently, we have shown that doctors in their first year of work, graduating from
4 selected cohorts from 1999 to 2009, have reported increasingly high levels of satisfaction, in
5 the more recent cohorts, with time off work for leisure and with enjoyment of their work.[20]
6
7
8

9 10 **The impact of the EWTD on senior doctors**

11
12 International research concerning the impact of working time restrictions on senior doctors is
13 limited. Richter et al. (2013) compared burnout among doctors prior to the implementation of
14 EWTD and post implementation in Hamburg, Germany (n=328). While the authors found a
15 decrease in working hours after the implementation of EWTD among junior doctors, a similar
16 decline was not found among seniors. Rather, the results indicated greater strain and
17 burnout among senior physicians with less time for rest.[21] Hutter (2006) studied the
18 working hour restriction in the US to 80 hours/week and found a reduction in burnout among
19 junior but not senior doctors.[22] These results are in line with our findings that the majority
20 of our UK respondents did not believe EWTD benefits senior doctors.
21
22
23
24
25
26
27
28
29
30

31
32 Other research has focused on surveying senior doctors or 'trainers' about their views on
33 how the EWTD has impacted on medical training. Tsourfouli (2008) held qualitative
34 interviews with 20 consultants, from surgical and medical specialties, who train junior doctors
35 across six trusts in Wales in 2005.[23].These trainers considered that there was a
36 disintegration of the apprenticeship style of learning in clinical training following the
37 implementation of the EWTD and the increased use of shift work. Respondents commented
38 on "the reduced availability of trainees, reduced interaction between trainees and trainers,
39 and reduced continuity" among effects of the implementation of the EWTD.[23] Doctors also
40 commented on the new roles and increased workload of consultant trainers as a result of
41 MMC.[23] A GMC survey of trainers (n=17,000) conducted between 2009 and 2010 found
42 that 58% believed that the training needs of their trainees were being met within the 48 hour
43 work week. However, 74.3% of trainers from the surgical specialties did not believe their
44 trainees needs were being met.[18] The GMC report in 2010 identified particular specialties
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 as having consistent concerns related to EWTD's effect on training opportunities, namely,
4 surgical specialties, obstetrics and gynaecology, emergency medicine, anaesthetics, and
5 paediatrics.[18] The GMC survey found that 49% of trainers indicated that they have
6
7 changed the way they teach trainees as a result of EWTD.[18] Just as junior doctors must
8
9 adapt their learning strategy within limited working hours, a culture shift from senior doctors
10
11 might be necessary to meet the evolving demands of medical training.
12
13

14
15
16 A systematic review of the literature reported inconclusive findings on the effects of
17
18 EWTD.[24] In fact, it is challenging to differentiate the changes resulting from EWTD in
19
20 isolation from those that may have resulted from other changes, including Modernising
21
22 Medical Careers, The New Deal, or wider structural reforms to the NHS.[25] Importantly, it is
23
24 difficult to differentiate between the effects of EWTD itself and the ways that Trusts and
25
26 Deaneries have implemented it.[4] For example, a GMC analysis of Annual Deanery Reports
27
28 from 2009 found that a few deaneries reported gaps in rotas which they felt were due to
29
30 EWTD. However, others reported compliance (though whether their juniors would invariably
31
32 agree may be open to question) and successful implementation of EWTD.[18]
33
34

35 **Strengths and Limitations**

36
37
38 This study is based on large numbers of respondents from across the UK. It covers all
39
40 doctors who graduated from all UK medical schools in two years, 1999 and 2000. It is a
41
42 systematic survey of all who were willing to respond in cohorts that have extensive
43
44 experience of work before and after the full implementation of the EWTD in medical practice.
45
46 As with all surveys, non-responder bias is possible. We included the section about the
47
48 EWTD in a multi-purpose survey with several other sections. We did not deem it possible to
49
50 delve in detail into the doctors' views about the EWTD: in our core work, we try to be thrifty
51
52 with questions to encourage doctors to respond.
53
54

55
56 The study represents the subjective views of doctors in these cohorts and does not include
57
58 any objective impact of the EWTD on the NHS, junior or senior doctors. Some caution is
59
60

1
2
3 advised in interpreting the results as respondents may have had difficulty in separating the
4 effects of EWTD itself, and the way it has been implemented, from those of other reforms to
5 the NHS and medical training. In addition, we did not have information on various factors
6 that may have influenced the findings, such as hospital size or the nature of rotations and
7 the organisation of shift work. For example, it has been suggested that surgical trainees
8 working in large hospitals, with larger volumes of operations, might be less dissatisfied with
9 the EWTD since these trainees have not been so limited in their operating experience.[26] A
10 further limitation is that our questioning, necessarily brief for practical reasons, aimed to seek
11 views on benefit; for those who disagreed that the EWTD had shown benefit, particularly in
12 respect of senior doctors, we do not know whether they thought that the effect of EWTD had
13 been damaging or simply neutral. It is striking, nonetheless, that only such a small proportion
14 felt able to specify that the EWTD had positive benefit.
15
16
17
18
19
20
21
22
23
24
25
26

27 28 **CONCLUSION**

29
30
31 The majority of doctors graduating from medical school in 1999 and 2000 did not agree that
32 the EWTD, as implemented in their experience, had benefited the NHS or senior doctors.
33 They were less negative about the impact of EWTD on junior doctors. We do not
34 recommend, and nor did our respondents advocate, a return to the very long working hours
35 of earlier times. However, there is a need for organisational changes, including well-
36 coordinated and planned rotas, with consideration of points made by doctors in the
37 accompanying paper,[5] to improve opportunities for training and clinical experience while
38 maintaining the requirement and the benefit of EWTD-compliant hours.
39
40
41
42
43
44
45
46
47
48
49
50

51 **Acknowledgements:** We would like to thank Emma Ayres for administering the surveys,
52 and Janet Justice and Alison Stockford for data entry. We are very grateful to all the doctors
53 who participated in the surveys. This is an independent report commissioned and funded by
54 the Policy Research Programme in the Department of Health. The views expressed are not
55
56
57
58
59
60

1
2
3 necessarily those of the Department. The Department of Health had no involvement in the
4 study design, collection, analysis and interpretation of the data, in the writing of the article, or
5 in the decision to submit it for publication.
6
7

8
9
10 **Ethical approval:** This study was approved by the National Research Ethics Service,
11 following referral to the Brighton and Mid-Sussex Research Ethics Committee in its role as a
12 multi-centre research ethics committee (ref 04/Q1907/48).
13

14
15
16 **Competing interests:** All authors declare no competing interests.
17

18
19
20 **Funding:** This is an independent report commissioned and funded by the Policy Research
21 Programme in the Department of Health (grant reference 016/0116). The views expressed
22 are not necessarily those of the Department.
23
24

25
26
27 **Author's contribution** MJG and TWL designed the study. JJM and TWL undertook the
28 analysis and JJM wrote the first draft. All authors contributed to further drafts and all agreed
29 to the final manuscript.
30
31

32
33
34 **Data sharing** The authors may be able to provide aggregated data on which the analysis is
35 based, on request.
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

REFERENCES

1. NHS Employers. *European Working Time Directive*. 2011.
<http://www.nhsemployers.org/PlanningYourWorkforce/MedicalWorkforce/EWTD/Pages/EWTD.aspx> (accessed 3 September 2013).
2. Royal College of Physicians. *The European Working Time Directive and working hours*.
<http://www.rcplondon.ac.uk/policy/physician-development/ewtd> (accessed 3 September 2013).
3. Royal College of Surgeons. *Surgeons, the European working time directive and August 1st 2009*. 2009. <http://www.rcseng.ac.uk/news/surgeons-the-european-working-time-directive-and-august-1st-2009#Ud51DG0U3Zg> (accessed 3 September 2013).
4. Temple J. NHS: Medical Education England, London *Time for training. A review of the impact of the European Working Time Directive on the quality of training*. 2010.
<http://www.mee.nhs.uk/PDF/14274%20Bookmark%20Web%20Version.pdf> (accessed 3 September 2013).
5. Clarke RT, Pitcher A, Lambert TW, et al. Doctors' views on the implementation of the European Working Time Directive: a qualitative analysis. *Unpublished: submitted to BMJ Open for consideration*.
6. Goldacre MJ, Turner G, Lambert TW. Variation by medical school in career choices of UK graduates of 1999 and 2000. *Med Educ* 2004;**38**:249–58.
7. Evans J, Lee P, Goldacre MJ, et al. Pre-registration house officers' comments on working in the NHS: a qualitative study of the views of UK medical graduates of 1999. *Med Teach* 2004;**26**:250-5.
8. Lambert TW, Goldacre MJ, Edwards C, et al. Career preferences of doctors who qualified in the United Kingdom in 1993 compared with those of doctors qualifying in 1974, 1977, 1980, and 1983. *BMJ* 1996;**313**:19–24.

- 1
2
3 9. Goldacre MJ, Davidson JM, Lambert TW. Career choices at the end of the pre-registration
4 year of doctors who qualified in the United Kingdom in 1996. *Med Educ* 1999;**33**:882–9.
5
6
7 10. Morrow G, Burford B, Carter M, et al. Durham University: Centre for Medical Education
8 Research. *The impact of the working time regulations on medical education and training:*
9 *literature review*. 2012. [http://www.gmc-](http://www.gmc-uk.org/The_Impact_of_the_Working_Time_Regulations_on_Medical_Education_and_Training_Literature_Review.pdf_51155615.pdf)
10 [uk.org/The_Impact_of_the_Working_Time_Regulations_on_Medical_Education_and_Traini](http://www.gmc-uk.org/The_Impact_of_the_Working_Time_Regulations_on_Medical_Education_and_Training_Literature_Review.pdf_51155615.pdf)
11 [ng_Literature_Review.pdf_51155615.pdf](http://www.gmc-uk.org/The_Impact_of_the_Working_Time_Regulations_on_Medical_Education_and_Training_Literature_Review.pdf_51155615.pdf) (accessed 3 September 2013).
12
13
14
15
16
17 11. Kelly BD, Curtin PD, Corcoran M. The effects of the European Working Time Directive on
18 surgical training: the basic surgical trainee's perspective. *Ir J Med Sci* 2011;**180**:435–7.
19
20
21 12. Tait MJ, Fellows GA, Pushpanathan S, et al. Current neurosurgical trainees' perception of
22 the European Working Time Directive and shift work. *British J Neurosurg* 2008;**22**:28–31.
23
24
25 13. West D, Codispoti M, Graham T. The European Working Time Directive and training in
26 cardiothoracic surgery in the United Kingdom: A report of the Specialty Advisory Board in
27 Cardiothoracic Surgery of The Royal College of Surgeons of Edinburgh. *Surgeon* 2007;**5**:81–5.
28
29
30
31 14. Lowry J, Cripps J. Results of the online EWTD trainee survey. *B R Coll Surg Engl* 2005;**87**:86–7.
32
33
34 15. Skipworth RJ, Terrace JD, Fulton LA, et al. Basic surgical training in the era of the European
35 Working Time Directive: what are the problems and solutions? *Scott Med J* 2008;**53**:18–21.
36
37
38 16. Parsons BA, Blencowe NS, Hollowood AD, et al. Surgical training: the impact of changes in
39 curriculum and experience. *J Surg Educ* 2011;**68**:44–51.
40
41
42 17. Jackson GP, Tarpley JL. How long does it take to train a surgeon? *BMJ* 2009;**339**:b4260.
43
44
45 18. General Medical Council (GMC). *GMC quality assurance of specialty including GP training*
46 *and the European Working Time Regulations: September to June 2010*. 2010.
47
48 [http://www.gmc-](http://www.gmc-uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sept_2009_to_June_2010_35872744.pdf)
49 [uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sep](http://www.gmc-uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sept_2009_to_June_2010_35872744.pdf)
50 [t_2009_to_June_2010_35872744.pdf](http://www.gmc-uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sept_2009_to_June_2010_35872744.pdf) (accessed 3 September 2013).
51
52
53
54
55
56
57
58
59
60

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
19. Goldacre MJ, Stear S, Lambert TW. Session 3: The pre-registration year: The trainees' experience. *Med Educ* 1997;**31**:57–60.
20. Lambert TW, Surman G, Goldacre MJ. Views of UK-trained medical graduates of 1999–2009 about their first postgraduate year of training: national surveys. *BMJ Open* 2013;**3**.
21. Richter A, Kostova P, Baur X, et al. Less work: more burnout? A comparison of working conditions and the risk of burnout by German physicians before and after the implementation of the EU Working Time Directive. *Int Arch Occup Environ Health* Published online First: 20 February 2013. doi:10.1007/s00420-013-0849-x
22. Hutter MM, Kellogg KC, Ferguson CM, et al. The impact of the 80-hour resident workweek on surgical residents and attending surgeons. *Ann Surg* 2006;**243**:864–71.
23. Tsouroufli M, Payne H. Consultant medical trainers, modernising medical careers (MMC) and the European time directive (EWTD): Tensions and challenges in a changing medical education context. *BMC Med Educ* 2008;**8**:31.
24. Moonesinghe SR, Lowery J, Shahi N, et al. Impact of reduction in working hours for doctors in training on postgraduate medical education and patients' outcomes: systematic review. *British Medical Journal* 2011;**342**:d1580.
25. General Medical Council (GMC). *The impact of the implementation of the European Working Time Directive (EWTD)*. 2011. http://www.gmc-uk.org/The_impact_of_the_implementation_of_the_European_Working_Time_Directive__EWTD__42536543.pdf (accessed 3 September 2013).
26. West D. European Working Time Directive implementation and cardiothoracic training: larger centers may optimise training. *Eur J Cardio-Thoracic Surgery* 2007;**31**:958.

Table 1: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited the NHS

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	73	9.9*	188	25.4*	479	64.7**	740
Paediatrics	36	17.8**	57	28.2	109	54.0	202
Emergency Medicine	22	15.1	41	28.1	83	56.8	146
Surgery	47	7.9**	96	16.2**	451	75.9**	594
Obstetrics & Gynaecology	5	8.9	12	21.4	39	69.6	56
Anaesthetics	50	14.5	72	20.9**	223	64.6*	345
Radiology	19	12.6	42	27.8	90	59.6	151
Clinical oncology	3	3.7*	16	19.8	62	76.5**	81
Pathology	13	10.3	38	30.2	75	59.5	126
Psychiatry	46	19.7**	79	33.8	109	46.6**	234
General Practice	176	12.5	541	38.3**	695	49.2**	1412
Other Medical	8	16.3	20	40.8	21	42.9	49
χ^2_{11} , p-value	42.6	<0.001	133.7	<0.001	176.1	<0.001	
Total	498	12.0	1202	29.1	2436	58.9	4136

The row of χ^2_{11} values and corresponding p-values indicates whether the variation in percentages, comparing specialties in each column, can be regarded as random. $P < 0.001$ indicates a probability of less than 1 in 1000 that the variation is due to chance.

Asterisks alongside percentages indicate specialties in which doctors take a significantly different view than doctors overall; * denotes $p < 0.05$ and ** $p < 0.01$, representing respectively a 5% and a 1% chance that the specialty variation from the overall average is due to chance.

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 2: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited senior doctors

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	52	7.0	177	23.8*	514	69.2**	743
Paediatrics	23	11.4*	47	23.3	132	65.3	202
Emergency Medicine	22	15.0*	35	23.8	90	61.2	147
Surgery	34	5.7**	89	15.0**	470	79.3**	593
Obstetrics & Gynaecology	5	8.9	9	16.1	42	75.0	56
Anaesthetics	34	9.9	74	21.4*	237	68.7*	345
Radiology	14	9.3	34	22.5	103	68.2	151
Clinical oncology	3	3.8	13	16.3*	64	80.0**	80
Pathology	5	4.0*	38	30.2	83	65.9	126
Psychiatry	37	15.8**	72	30.8	125	53.4**	234
General Practice	142	10.1	520	36.9**	748	53.0**	1410
Other Medical	6	12.2	19	38.8	24*	49.0	49
χ^2_{11}, p-value	41.4	<0.001	138.9	<0.001	174.3	<0.001	
Total	377	9.1	1127	27.2	2632	63.6	4136

See notes to Table 1 for explanation of statistical terminology (χ^2_{11} , p-values and asterisks).

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 3: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited junior doctors

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	219	29.4	178	23.9	347	46.6	744
Paediatrics	74	36.6	43	21.3	85	42.1	202
Emergency Medicine	62	42.5**	29	19.9*	55	37.7*	146
Surgery	109	18.4**	70	11.8**	415	69.9**	594
Obstetrics & Gynaecology	18	32.1	8	14.3	30	53.6	56
Anaesthetics	101	29.3	55	15.9**	189	54.8**	345
Radiology	47	30.9	26	17.1	79	52.0	152
Clinical oncology	15	18.5*	15	18.5	51	63.0**	81
Pathology	37	29.4	21	16.7	68	54.0	126
Psychiatry	110	46.8**	55	23.4	70	29.8**	235
General Practice	480	33.9**	397	28.1**	537	38.0**	1414
Other Medical	17	34.0	15	30.0	18	36.0	50
χ^2_{11} , p-value	97.0	<0.001	84.8	<0.001	230.0	<0.001	
Total	1289	31.1	912	22.0	1944	46.9	4145

See notes to Table 1 for explanation of statistical terminology (χ^2_{11} , p-values and asterisks).

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 4: Doctors views about the implementation of the European Working Time Regulations, comparing the views of men and women

The implementation of the EWTD:	Men		Women		Total	
	n	%	n	%	n	%
Has benefited the NHS¹						
Strongly agree/agree	242	12.3	263	11.8	505	12.0
Neither agree nor disagree	491	25.0	728	32.6	1219	29.1
Strongly disagree/Disagree	1228	62.6	1244	55.7	2472	58.9
Total	1961	100	2235	100	4196	100
Has benefited senior doctors²						
Strongly agree/agree	192	9.8	190	8.5	382	9.1
Neither agree nor disagree	515	26.2	632	28.3	1147	27.3
Strongly disagree/Disagree	1255	64.0	1412	63.2	2667	63.6
Total	1962	100	2234	100	4196	100
Has benefited junior doctors³						
Strongly agree/agree	543	27.6	768	34.3	1311	31.2
Neutral	399	20.3	522	23.3	921	21.9
Strongly disagree/disagree	1024	52.1	949	42.4	1973	46.9
Total	1966	100	2239	100	4205	100

Results of χ^2_2 test for trend across the 3 categories of response, comparing men and women's responses:

¹ $\chi^2_2 = 29.3$, $p < 0.001$

² $\chi^2_2 = 3.5$, $p = 0.17$

³ $\chi^2_2 = 40.3$, $p < 0.001$

Results include 60 doctors with an unknown specialty, were unemployed, or not working in medicine.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For peer review only

BMJ Open: first published as 10.1136/bmjopen-2013-004391 on 6 February 2014. Downloaded from <http://bmjopen.bmj.com/> on April 19, 2024 by guest. Protected by copyright.

UK doctors' views on the implementation of the European Working Time

Directive as applied to medical practice: a quantitative analysis

Jenny J Maisonneuve, Research officer^a

Trevor W Lambert, Statistician^a

Michael J Goldacre, Professor of public health^a

^a UK Medical Careers Research Group, Nuffield Department of Population Health, University of Oxford, Old Road Campus, Headington, Oxford, OX3 7LF

Correspondence to:

Trevor Lambert, Unit of Health-Care Epidemiology, Nuffield Department of Population Health, University of Oxford, Rosemary Rue Building, Old Road Campus, Oxford OX7 3LF

Tel: +44 (0) 01865 289389

Fax: +44 (0) 01865 289379

Email: trevor.lambert@dph.ox.ac.uk

Keywords: European Working Time Directive, United Kingdom, doctor, workforce, medical training

Word count: 2,909

ABSTRACT [247 words]

Objectives To report on doctors' views, from all specialty backgrounds, about the European Working Time Directive (EWTD) and its impact on the NHS, senior doctors, and junior doctors.

Design All medical school graduates from 1999 and 2000 were surveyed by post and email in 2012.

Setting United Kingdom

Methods Among other questions, in a multi-purpose survey about medical careers and career intentions, doctors were asked to respond to three statements about the EWTD on a five-point scale (from strongly agree to strongly disagree): '*The implementation of the EWTD has benefited the NHS*', '*The implementation of the EWTD has benefited senior doctors*', '*The implementation of the EWTD has benefited junior doctors*'.

Results The response rate was 54.4% overall (4,486/8,252), 55.8% (2,256/4,042) of the 1999 cohort and 53.0% (2,230/4,210) of the 2000 cohort. 54.1% (2,427) of all respondents were women. Only 12% (498/4136 doctors) agreed that the EWTD has benefited the NHS, 9% (377) that it has benefited senior doctors, and 31% (1289) that it has benefited junior doctors. Doctors views on EWTD differed significantly by specialty groups: 'craft' specialties like surgery, requiring extensive experience in performing operations, were particularly critical.

Conclusion These cohorts have experience of working in the NHS both before and after the implementation of EWTD. Their lack of support for the EWTD four years after its implementation should be a concern. However, it is unclear whether problems rest with the current ceiling on hours worked or with the ways in which EWTD has been implemented.

ARTICLE SUMMARY

Strengths and limitations of this study

- This study is a systematic survey of all UK medical graduates from 1999 and 2000 willing to reply. These cohorts have extensive experience of work before and after the full implementation of the EWTD in medical practice.
- As with all surveys, non-responder bias is possible. The study represents the subjective views of doctors and does not include any objective impact of the EWTD on the NHS, junior or senior doctors.
- Respondents may have had difficulty in separating the effects of EWTD itself, and the way it has been implemented, from those of other reforms to the NHS and medical training.
- We have no information on various factors, such as hospital size or the nature of rotas and the organisation of shift work, that may have influenced doctors' views.

INTRODUCTION

The European Working Time Regulations (EWTD) mandated the reduction of working hours for doctors in the UK to a maximum of 48 hours per week (averaged over a six month period). Its implementation in the National Health Service (NHS) was phased in over time with partial implementation in 2004 (56 hours) and full implementation in 2009. In addition to limits on working hours, the EWTD sets out rest periods to limit continuous periods of work. The goal in reducing working hours is to promote workers' health and safety by decreasing fatigue among doctors; and thereby to improve patient safety. The EWTD has been enshrined in law as the European Working Time Regulations (EWTR) but, for simplicity and using the commoner phrase, we use the term EWTD throughout.

Considerable controversy has surrounded the EWTD in the NHS. Concerns have been raised by bodies such as NHS Employers.[1] The Royal College of Physicians have expressed concerns that it may have adverse effects on the quality of medical training.[2] The Royal College of Surgeons has commented on reduced time for training and possible patient safety issues.[3] An independent review was commissioned by Medical Education England (MEE) in 2010 to examine the impact of EWTD on the training of health care professionals.[4] Among other recommendations, the review proposed the implementation of a consultant delivered health service to be 'directly responsible for the delivery of 24/7 care' and to 'work more flexibly to deliver high quality training and service'.

As part of a multi-purpose series of surveys of doctors, mainly aimed at obtaining information about their career intentions, we were struck by the number of spontaneous comments doctors made about EWTD.[5] In an accompanying paper we reported results of a qualitative analysis of the comments made in 2010 by doctors who qualified in the cohorts of 1993, 2005 and 2010.[5] The doctors who commented were largely negative about the EWTD. We had not raised EWTD at all in our questionnaires; the doctors wanted to raise it with us. In order to judge whether these were representative views, in our next scheduled surveys in

1
2
3
4
5
6
7 our programme, surveys of the qualifiers of 1999 and 2000, we added a brief section on the
8 EWTD inviting all doctors to express a view. The aim was to get views from all respondents
9 and not just those who self-selected to volunteer their views. The doctors we surveyed had
10 worked for over a decade after qualification, and had experience of working both before and
11 after the implementation of the EWTD in the NHS. Our objective in this paper is to report on
12 the views of doctors about whether the implementation of the EWTD has benefited the NHS,
13 senior doctors, and junior doctors. We also investigated whether there were differences in
14 views between different specialties and between men and women.
15
16
17
18
19

20 21 **METHODS**

22
23 All graduates from all medical schools in the UK in 1999 and 2000 were identified from
24 General Medical Council registrations. We have previously surveyed these doctors one,
25 three, five, and seven years after graduation.[6, 7] In 2012, our fifth survey, over a decade
26 after the doctors' graduation, we included questions about the EWTD.
27
28
29
30

31 The questionnaire contained the following three statements: *'The implementation of the*
32 *EWTD has benefited the NHS'*, *'The implementation of the EWTD has benefited senior*
33 *doctors'*, and *'The implementation of the EWTD has benefited junior doctors'*. Doctors were
34 asked to respond to each statement using a five-point scale from *'strongly agree'* to *'strongly*
35 *disagree'*. Doctors were also asked a range of questions about their current and previous
36 posts and about their future career intentions. Doctors were sent the questionnaire by post
37 and by email. Several reminders were sent to non-responders. Further details of our
38 methodology are available elsewhere.[8, 9]
39
40
41
42
43
44
45

46 We analysed doctors' responses to the questions overall, by specialty group and gender.
47 Specialties were grouped by us as adult hospital medical specialties, paediatrics, emergency
48 medicine, surgery, obstetrics & gynaecology, anaesthetics, radiology, clinical oncology,
49 pathology, psychiatry, general practice, and 'other medical specialties' comprising those in
50 public health and community health. Those unemployed, not working in medicine, or with an
51
52
53
54

1
2
3
4
5
6
7 unknown specialty were not included in the analysis by specialty. We used chi-squared tests
8 and adjusted residuals to compare responses by specialty sub-group. Adjusted residuals
9 provide a simple means of identifying specialties in which doctors showed a particularly high
10 or low level of percentage agreement or disagreement with the statements above (also see
11 footnotes to Table 1).
12
13
14

15 16 **RESULTS**

17
18 The cohorts of 1999 and 2000 comprised 8,652 medical graduates (4,219 and 4,433,
19 respectively). We excluded from the overall total 279 who were not contactable, 12
20 deceased, and 109 who told us that they did not wish to participate. The response rate was
21 54.4% overall (4,486/8,252), 55.8% (2,256/4,042) of the 1999 cohort and 53.0%
22 (2,230/4,210) of the 2000 cohort. 54.1% (2,427) of all respondents were women. Of the
23 4,486 replies 290 doctors did not respond to the specific questions concerning the effect of
24 EWTD on senior doctors (154 from 1999 and 136 from 2000) and the NHS (152 from 1999
25 and 138 from 2000). 281 did not respond to the question about junior doctors (152 from
26 1999 and 129 from 2000). 60 respondents to the three statements had an unknown
27 specialty, were not working in medicine, or were unemployed.
28
29
30
31
32
33
34
35
36

37 **The implementation of the EWTD has benefited the NHS (Table 1)**

38
39 Overall, 12.0% (498/4136) agreed that the EWTD had benefited the NHS, 58.9% of doctors
40 (2436/4136) disagreed, and 29.1% (1202/4136) were neutral. The majority of surgeons
41 (75.9%) and of physicians in adult hospital medical specialists (64.7%) disagreed, as did
42 76.5% of specialists in clinical oncology (all four groups had significantly higher levels of
43 disagreement than the all-specialty average, Table 1) Psychiatrists (46.6% disagreement)
44 and GPs (49.2%) were significantly less likely to disagree than the all-specialty average
45 (Table 1).
46
47
48
49
50
51

52 **The implementation of the EWTD has benefited senior doctors (Table 2)**

1
2
3
4
5
6
7 Only 9.1% (377/4,136) agreed that the EWTD had ~~been~~ benefited senior doctors. The
8 majority disagreed (63.6%, 2,632/4,136) and 27.2% (1,127/4,136) were neutral. Specialists
9 in clinical oncology (80%), surgery (79%), and the adult medical specialties (69.2%) had
10 significantly high levels of disagreement, while anaesthetics (68.7%) and radiology (68.2%)
11 also showed high levels of disagreement which did not attain statistical significance (perhaps
12 as a result of smaller numbers). Very few surgeons (5.7%, 34/593) agreed with the
13 statement. GPs showed a high level of neutrality, with 36.9% (520/1,410) neither agreeing
14 nor disagreeing with the statement.
15
16
17
18
19

20 21 **The implementation of the EWTD has benefited junior doctors (Table 3)**

22
23 Respondents were more inclined to agree that EWTD has benefited junior doctors in
24 contrast to how they viewed its impact on seniors and on the wider NHS. A total of 31.1%
25 (1289/4145) agreed with the statement, 21.9% (912/4145) were neutral and 46.9%
26 (1944/4145) disagreed. Surgeons (70%), clinical oncologists (63%) and anaesthetists (55%)
27 showed higher levels of disagreement than average, while GPs (38%), psychiatrists (30%)
28 and specialists in emergency medicine (38%) had lower than average levels of
29 disagreement.
30
31
32
33
34
35

36 37 **Men compared to women (Table 4)**

38
39 Women were more inclined than men to express the view that the EWTD has benefited
40 junior doctors (Table 4). Men were more inclined than women to disagree that the
41 implementation of EWTD had benefited the NHS and a higher percentage of women than
42 men held neutral views. Views of men and women about senior doctors and the EWTD did
43 not differ appreciably.
44
45
46
47

48 49 **DISCUSSION**

50 51 **Main Findings**

1
2
3
4
5
6
7 The great majority of doctors did not agree that the EWTD has benefited the NHS or senior
8 doctors. Doctors were more positive about its benefits for junior doctors but, even so, fewer
9 than a third felt that the EWTD had benefited junior doctors. The negative views of the
10 EWTD four years after its implementation indicate that it is a continuing concern for doctors.
11 There were significant differences between respondents in different specialties. Doctors in
12 the surgical specialties, the hospital physician specialties, anaesthetics and clinical oncology
13 were significantly more negative about the implementation of EWTD than the all-specialty
14 average; doctors in psychiatry and general practice were less negative. Gender differences
15 in views were modest. Men were, however, rather more negative about the effects of
16 implementing EWTD in respect of the NHS overall and of the effects on junior doctors, than
17 were women, though the views of the effects on senior doctors were equally negative for
18 both genders.

28 **The impact of the EWTD on junior doctors**

29
30
31 The impact of working limits has been studied throughout the “roll out” of the EWTD. Some
32 studies examined the effect of a 56 hour limit and others of 48 hours. The literature
33 concerning perceptions and attitudes towards working time restrictions varies in its quality
34 and generalisability.[10] Studies of the surgical specialties typically report surgeons to have
35 a negative view of the EWTD.[11-15] Our findings confirm this. Previous studies of the views
36 of surgical trainees have found concerns about reduced contact time with trainers,[14]
37 reduced clinical exposure and operative experience,[12, 16] and adverse impact on patient
38 care.[11, 12] Our findings indicate that few surgeons believe junior doctors benefit from the
39 EWTD. The surgical specialties, often regarded as craft specialties, require development of
40 proficient manual dexterity and expertise alongside the development of medical and surgical
41 knowledge. Restricting working hours has been argued to lengthen the amount of time it
42 takes to develop this expertise.[17] Another issue has been a potential conflict between
43 junior doctors’ ability to balance training opportunities with service provision within reduced
44 working hours.[18] In 2010 the GMC surveyed trainees and asked if they found it was taking

1
2
3
4
5
6
7 longer to achieve educational competencies as a result of 48 hour restrictions from EWTD
8 (with responses invited of Yes, Unsure, No). They found 51.4% of surgical trainees, 49.3%
9 of trainees in obstetrics and gynaecology, and 47.6% of trainees in anaesthetics believed
10 that it took longer to achieve the required educational competencies.[18] In contrast, 72.5%
11 of trainee GPs, 66.3% in psychiatry, 58.1% in pathology, and 52.7% in emergency medicine
12 believed that EWTD did not limit the achievement of their educational competencies.[18]
13
14
15
16

17
18 In the context of the EWTD in 2013, it is worth considering the comments we received from
19 doctors whom we studied in similar ways 20 years ago when junior doctors worked very long
20 hours. For example, we studied the qualifiers of 1993 at the end of their pre-registration year
21 in 1994. We reported our concerns about the fact that many trainees wrote telling us of the
22 adverse impact on them of working very long and intensive hours.[19] As we reported
23 then,[19] “some doctors clearly suffered in the pre-registration year”. Some made vivid
24 comments about fatigue-related stress. We quoted a doctor who wrote “I have been nearly
25 suicidal throughout some of last year”, as a result of exhaustion; and another who wrote
26 “The fact that I haven’t killed anyone through exhaustion leading to medical error is a
27 miracle”. We reported that a formal key word search on such terms as ‘exhaustion’ and
28 ‘fatigue’ showed that 10% of all who replied to our questionnaire (259/2621 doctors) in 1994
29 spontaneously made working-hours-related comments that we considered worrying.
30
31
32
33
34
35
36
37
38

39 Nowadays we ~~do not~~ get many, ~~if any, fewer~~ comments like these; ~~in our recent study of the~~
40 ~~2012 graduates in 2013, we found only 2 doctors of 2419 respondents mentioned work-~~
41 ~~related ‘exhaustion’ or ‘fatigue’ or ‘tiredness’, although ‘stress’ was mentioned by 43 and,~~
42 ~~although~~ we get many comments about “unfairness of unpaid overtime” and not being able
43 to declare non-compliant hours.[5] To illustrate diversity among doctors,[19] we also quoted
44 one who wrote in the very long working hours of 1994: “I am quite happy with my working
45 hours. Further reductions could be detrimental to the level of experience gained from the
46 job”.
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Formatted: Font: (Default) Arial, Not Bold

Formatted: Font: (Default) Arial, Not Bold, Font color: Text 1

Formatted: Font: (Default) Arial, Not Bold

1
2
3
4
5
6
7 More recently, we have shown that doctors in their first year of work, graduating from
8 selected cohorts from 1999 to 2009, have reported increasingly high levels of satisfaction, in
9 the more recent cohorts, with time off work for leisure and with enjoyment of their work.[20]
10
11

12 **The impact of the EWTD on senior doctors**

13
14
15 International research concerning the impact of working time restrictions on senior doctors is
16 limited. Richter et al. (2013) compared burnout among doctors prior to the implementation of
17 EWTD and post implementation in Hamburg, Germany (n=328). While the authors found a
18 decrease in working hours after the implementation of EWTD among junior doctors, a similar
19 decline was not found among seniors. Rather, the results indicated greater strain and
20 burnout among senior physicians with less time for rest.[21] Hutter (2006) studied the
21 working hour restriction in the US to 80 hours/week and found a reduction in burnout among
22 junior but not senior doctors.[22] These results are in line with our findings that the majority
23 of our UK respondents did not believe EWTD benefits senior doctors.
24
25
26
27
28
29
30

31
32 Other research has focused on surveying senior doctors or 'trainers' about their views on
33 how the EWTD has impacted on medical training. Tsourfouli (2008) held qualitative
34 interviews with 20 consultants, from surgical and medical specialties, who train junior doctors
35 across six trusts in Wales in 2005.[23].These trainers considered that there was a
36 disintegration of the apprenticeship style of learning in clinical training following the
37 implementation of the EWTD and the increased use of shift work. Respondents commented
38 on "the reduced availability of trainees, reduced interaction between trainees and trainers,
39 and reduced continuity" among effects of the implementation of the EWTD.[23] Doctors also
40 commented on the new roles and increased workload of consultant trainers as a result of
41 MMC.[23] A GMC survey of trainers (n=17,000) conducted between 2009 and 2010 found
42 that 58% believed that the training needs of their trainees were being met within the 48 hour
43 work week. However, 74.3% of trainers from the surgical specialties did not believe their
44 trainees needs were being met.[18] The GMC report in 2010 identified particular specialties
45
46
47
48
49
50
51
52
53
54

1
2
3
4
5
6
7 as having consistent concerns related to EWTD's effect on training opportunities, namely,
8 surgical specialties, obstetrics and gynaecology, emergency medicine, anaesthetics, and
9 paediatrics.[18] The GMC survey found that 49% of trainers indicated that they have
10 changed the way they teach trainees as a result of EWTD.[18] Just as junior doctors must
11 adapt their learning strategy within limited working hours, a culture shift from senior doctors
12 might be necessary to meet the evolving demands of medical training.
13
14
15
16

17
18 A systematic review of the literature reported inconclusive findings on the effects of
19 EWTD.[24] In fact, it is challenging to differentiate the changes resulting from EWTD in
20 isolation from those that may have resulted from other changes, including Modernising
21 Medical Careers, The New Deal, or wider structural reforms to the NHS.[25] Importantly, it is
22 difficult to differentiate between the effects of EWTD itself and the ways that Trusts and
23 Deaneries have implemented it.[4] For example, a GMC analysis of Annual Deanery Reports
24 from 2009 found that a few deaneries reported gaps in rotas which they felt were due to
25 EWTD. However, others reported compliance (though whether their juniors would invariably
26 agree may be open to question) and successful implementation of EWTD.[18]
27
28
29
30
31
32
33

34 **Strengths and Limitations**

35
36 This study is based on large numbers of respondents from across the UK. It covers all
37 doctors who graduated from all UK medical schools in two years, 1999 and 2000. It is a
38 systematic survey of all who were willing to respond in cohorts that have extensive
39 experience of work before and after the full implementation of the EWTD in medical practice.
40
41 As with all surveys, non-responder bias is possible. We included the section about the
42 EWTD in a multi-purpose survey with several other sections. We did not deem it possible to
43 delve in detail into the doctors' views about the EWTD: in our core work, we try to be thrifty
44 with questions to encourage doctors to respond.
45
46
47
48
49
50

51
52 The study represents the subjective views of doctors in these cohorts and does not include
53 any objective impact of the EWTD on the NHS, junior or senior doctors. Some caution is
54

1
2
3
4
5
6
7 advised in interpreting the results as respondents may have had difficulty in separating the
8 effects of EWTD itself, and the way it has been implemented, from those of other reforms to
9 the NHS and medical training. In addition, we did not have information on various factors
10 that may have influenced the findings, such as hospital size or the nature of rotations and
11 the organisation of shift work. For example, it has been suggested that surgical trainees
12 working in large hospitals, with larger volumes of operations, might be less dissatisfied with
13 the EWTD since these trainees have not been so limited in their operating experience.[26] A
14 further limitation is that our questioning, necessarily brief for practical reasons, aimed to seek
15 views on benefit; for those who disagreed that the EWTD had shown benefit, particularly in
16 respect of senior doctors, we do not know whether they thought that the effect of EWTD had
17 been damaging or simply neutral. It is striking, nonetheless, that only such a small proportion
18 felt able to specify that the EWTD had positive benefit.
19
20
21
22
23
24
25
26
27

28 CONCLUSION

29
30
31 The majority of doctors graduating from medical school in 1999 and 2000 did not agree that
32 the EWTD, as implemented in their experience, had benefited the NHS or senior doctors.
33 They were less negative about the impact of EWTD on junior doctors. We do not
34 recommend, and nor did our respondents advocate, a return to the very long working hours
35 of earlier times. However, there is a need for organisational changes, including well-
36 coordinated and planned rotas, with consideration of points made by doctors in the
37 accompanying paper,[5] to improve opportunities for training and clinical experience while
38 maintaining the requirement and the benefit of EWTD-compliant hours.
39
40
41
42
43
44
45
46
47

48 **Acknowledgements:** We would like to thank Emma Ayres for administering the surveys,
49 and Janet Justice and Alison Stockford for data entry. We are very grateful to all the doctors
50 who participated in the surveys. This is an independent report commissioned and funded by
51 the Policy Research Programme in the Department of Health. The views expressed are not
52
53
54
55

necessarily those of the Department. The Department of Health had no involvement in the study design, collection, analysis and interpretation of the data, in the writing of the article, or in the decision to submit it for publication.

Ethical approval: This study was approved by the National Research Ethics Service, following referral to the Brighton and Mid-Sussex Research Ethics Committee in its role as a multi-centre research ethics committee (ref 04/Q1907/48).

Competing interests: All authors declare no competing interests.

Funding: This is an independent report commissioned and funded by the Policy Research Programme in the Department of Health (grant reference 016/0116). The views expressed are not necessarily those of the Department.

Author's contribution MJG and TWL designed the study. JJM and TWL undertook the analysis and JJM wrote the first draft. All authors contributed to further drafts and all agreed to the final manuscript.

Data sharing The authors may be able to provide aggregated data on which the analysis is based, on request.

REFERENCES

1. NHS Employers. *European Working Time Directive*. 2011. <http://www.nhsemployers.org/PlanningYourWorkforce/MedicalWorkforce/EWTD/Pages/EWTD.aspx> (accessed 3 September 2013).
2. Royal College of Physicians. *The European Working Time Directive and working hours*. <http://www.rcplondon.ac.uk/policy/physician-development/ewtd> (accessed 3 September 2013).
3. Royal College of Surgeons. *Surgeons, the European working time directive and August 1st 2009*. 2009. <http://www.rcseng.ac.uk/news/surgeons-the-european-working-time-directive-and-august-1st-2009#.Ud51DG0U3Zg> (accessed 3 September 2013).

4. Temple J. NHS: Medical Education England, London *Time for training. A review of the impact of the European Working Time Directive on the quality of training*. 2010. <http://www.mee.nhs.uk/PDF/14274%20Bookmark%20Web%20Version.pdf> (accessed 3 September 2013).
5. Clarke RT, Pitcher A, Lambert TW, Goldacre MJ. Doctors' views on the implementation of the European Working Time Directive: a qualitative analysis. *Unpublished: submitted to BMJ Open for consideration*.
6. Goldacre MJ, Turner G, Lambert TW. Variation by medical school in career choices of UK graduates of 1999 and 2000. *Med Educ* 2004;**38**:249–58.
7. Evans J, Lee P, Goldacre MJ, Lambert TW. Pre-registration house officers' comments on working in the NHS: a qualitative study of the views of UK medical graduates of 1999. *Med Teach* 2004;**26**:250-5.
8. Lambert TW, Goldacre MJ, Edwards C, Parkhouse J. Career preferences of doctors who qualified in the United Kingdom in 1993 compared with those of doctors qualifying in 1974, 1977, 1980, and 1983. *BMJ* 1996;**313**:19–24.
9. Goldacre MJ, Davidson JM, Lambert TW. Career choices at the end of the pre-registration year of doctors who qualified in the United Kingdom in 1996. *Med Educ* 1999;**33**:882–9.
10. Morrow G, Burford B, Carter M, Illing J. Durham University: Centre for Medical Education Research. *The impact of the working time regulations on medical education and training: literature review*. 2012. http://www.gmc-uk.org/The_Impact_of_the_Working_Time_Regulations_on_Medical_Education_and_Training_Literature_Review.pdf_51155615.pdf (accessed 3 September 2013).
11. Kelly BD, Curtin PD, Corcoran M. The effects of the European Working Time Directive on surgical training: the basic surgical trainee's perspective. *Ir J Med Sci* 2011;**180**:435–7.
12. Tait MJ, Fellows GA, Pushpanathan S, *et al*. Current neurosurgical trainees' perception of the European Working Time Directive and shift work. *British J Neurosurg* 2008;**22**:28–31.

- 1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
13. West D, Codispoti M, Graham T. The European Working Time Directive and training in cardiothoracic surgery in the United Kingdom: A report of the Specialty Advisory Board in Cardiothoracic Surgery of The Royal College of Surgeons of Edinburgh. *Surgeon* 2007;**5**:81–5.
 14. Lowry J, Cripps J. Results of the online EWTD trainee survey. *B R Coll Surg Engl* 2005;**87**:86–7.
 15. Skipworth RJ, Terrace JD, Fulton LA, Anderson DN. Basic surgical training in the era of the European Working Time Directive: what are the problems and solutions? *Scott Med J* 2008;**53**:18–21.
 16. Parsons BA, Blencowe NS, Hollowood AD, Grant JR. Surgical training: the impact of changes in curriculum and experience. *J Surg Educ* 2011;**68**:44–51.
 17. Jackson GP, Tarpley JL. How long does it take to train a surgeon? *BMJ* 2009;**339**:b4260.
 18. General Medical Council (GMC). *GMC quality assurance of specialty including GP training and the European Working Time Regulations: September to June 2010*. 2010.
http://www.gmc-uk.org/GMC_quality_assurance_of_Specialty_including_GP_training_and_the_EWTR__Sept_2009_to_June_2010_35872744.pdf (accessed 3 September 2013).
 19. Goldacre MJ, Stear S, Lambert TW. Session 3: The pre-registration year: The trainees' experience. *Med Educ* 1997;**31**:57–60.
 20. Lambert TW, Surman G, Goldacre MJ. Views of UK-trained medical graduates of 1999–2009 about their first postgraduate year of training: national surveys. *BMJ Open* 2013;**3**:e003553.
 21. Richter A, Kostova P, Baur X, Wegner R. Less work: more burnout? A comparison of working conditions and the risk of burnout by German physicians before and after the implementation of the EU Working Time Directive. *Int Arch Occup Environ Health* Published online First: 20 February 2013. doi:10.1007/s00420-013-0849-x
 22. Hutter MM, Kellogg KC, Ferguson CM, Abbott WM, Warshaw AL. The impact of the 80-hour resident workweek on surgical residents and attending surgeons. *Ann Surg* 2006;**243**:864–71.

- 1
2
3
4
5
6
7 23. Tsouroufli M, Payne H. Consultant medical trainers, modernising medical careers (MMC) and
8 the European time directive (EWTD): Tensions and challenges in a changing medical
9 education context. *BMC Med Educ* 2008;**8**:31.
10
11
12 24. Moonesinghe SR, Lowery J, Shahi N, Millen A, Beard JD. Impact of reduction in working
13 hours for doctors in training on postgraduate medical education and patients' outcomes:
14 systematic review. *British Medical Journal* 2011;**342**:d1580.
15
16
17 25. General Medical Council (GMC). *The impact of the implementation of the European Working*
18 *Time Directive (EWTD)*. 2011. [http://www.gmc-](http://www.gmc-uk.org/The_impact_of_the_implementation_of_the_European_Working_Time_Directive__EWTD__42536543.pdf)
19 [uk.org/The_impact_of_the_implementation_of_the_European_Working_Time_Directive__E](http://www.gmc-uk.org/The_impact_of_the_implementation_of_the_European_Working_Time_Directive__EWTD__42536543.pdf)
20 [WTD__42536543.pdf](http://www.gmc-uk.org/The_impact_of_the_implementation_of_the_European_Working_Time_Directive__EWTD__42536543.pdf) (accessed 3 September 2013).
21
22
23
24
25 26. West D. European Working Time Directive implementation and cardiothoracic training:
26 larger centers may optimise training. *Eur J Cardio-Thoracic Surgery* 2007;**31**:958.
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 1: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited the NHS

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	73	9.9*	188	25.4*	479	64.7**	740
Paediatrics	36	17.8**	57	28.2	109	54.0	202
Emergency Medicine	22	15.1	41	28.1	83	56.8	146
Surgery	47	7.9**	96	16.2**	451	75.9**	594
Obstetrics & Gynaecology	5	8.9	12	21.4	39	69.6	56
Anaesthetics	50	14.5	72	20.9**	223	64.6*	345
Radiology	19	12.6	42	27.8	90	59.6	151
Clinical oncology	3	3.7*	16	19.8	62	76.5**	81
Pathology	13	10.3	38	30.2	75	59.5	126
Psychiatry	46	19.7**	79	33.8	109	46.6**	234
General Practice	176	12.5	541	38.3**	695	49.2**	1412
Other Medical	8	16.3	20	40.8	21	42.9	49
χ^2_{11} , p-value	42.6	<0.001	133.7	<0.001	176.1	<0.001	
Total	498	12.0	1202	29.1	2436	58.9	4136

The row of χ^2_{11} values and corresponding p-values indicates whether the variation in percentages, comparing specialties in each column, can be regarded as random. $P < 0.001$ indicates a probability of less than 1 in 1000 that the variation is due to chance.

Asterisks alongside percentages indicate specialties in which doctors take a significantly different view than doctors overall; * denotes $p < 0.05$ and ** $p < 0.01$, representing respectively a 5% and a 1% chance that the specialty variation from the overall average is due to chance.

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 2: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited senior doctors

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	52	7.0	177	23.8*	514	69.2**	743
Paediatrics	23	11.4*	47	23.3	132	65.3	202
Emergency Medicine	22	15.0*	35	23.8	90	61.2	147
Surgery	34	5.7**	89	15.0**	470	79.3**	593
Obstetrics & Gynaecology	5	8.9	9	16.1	42	75.0	56
Anaesthetics	34	9.9	74	21.4*	237	68.7*	345
Radiology	14	9.3	34	22.5	103	68.2	151
Clinical oncology	3	3.8	13	16.3*	64	80.0**	80
Pathology	5	4.0*	38	30.2	83	65.9	126
Psychiatry	37	15.8**	72	30.8	125	53.4**	234
General Practice	142	10.1	520	36.9**	748	53.0**	1410
Other Medical	6	12.2	19	38.8	24*	49.0	49
χ^2_{11} , p-value	41.4	<0.001	138.9	<0.001	174.3	<0.001	
Total	377	9.1	1127	27.2	2632	63.6	4136

See notes to Table 1 for explanation of statistical terminology (χ^2_{11} , p-values and asterisks).

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 3: Doctors views, by specialty, on whether the implementation of the European Working Time Regulations has benefited junior doctors

Specialty group	Strongly agree or agree		Neither agree nor disagree		Strongly disagree or disagree		Total N (100%)
	n	%	n	%	n	%	
Adult Medical Specialties	219	29.4	178	23.9	347	46.6	744
Paediatrics	74	36.6	43	21.3	85	42.1	202
Emergency Medicine	62	42.5**	29	19.9*	55	37.7*	146
Surgery	109	18.4**	70	11.8**	415	69.9**	594
Obstetrics & Gynaecology	18	32.1	8	14.3	30	53.6	56
Anaesthetics	101	29.3	55	15.9**	189	54.8**	345
Radiology	47	30.9	26	17.1	79	52.0	152
Clinical oncology	15	18.5*	15	18.5	51	63.0**	81
Pathology	37	29.4	21	16.7	68	54.0	126
Psychiatry	110	46.8**	55	23.4	70	29.8**	235
General Practice	480	33.9**	397	28.1**	537	38.0**	1414
Other Medical	17	34.0	15	30.0	18	36.0	50
χ^2_{11} , p-value	97.0	<0.001	84.8	<0.001	230.0	<0.001	
Total	1289	31.1	912	22.0	1944	46.9	4145

See notes to Table 1 for explanation of statistical terminology (χ^2_{11} , p-values and asterisks).

60 respondents whose specialty was unknown, who were unemployed, or who did not work in medicine were excluded.

Table 4: Doctors views about the implementation of the European Working Time Regulations, comparing the views of men and women

The implementation of the EWTD:	Men		Women		Total	
	n	%	n	%	n	%
Has benefited the NHS¹						
Strongly agree/agree	242	12.3	263	11.8	505	12.0
Neither agree nor disagree	491	25.0	728	32.6	1219	29.1
Strongly disagree/Disagree	1228	62.6	1244	55.7	2472	58.9
Total	1961	100	2235	100	4196	100
Has benefited senior doctors²						
Strongly agree/agree	192	9.8	190	8.5	382	9.1
Neither agree nor disagree	515	26.2	632	28.3	1147	27.3
Strongly disagree/Disagree	1255	64.0	1412	63.2	2667	63.6
Total	1962	100	2234	100	4196	100
Has benefited junior doctors³						
Strongly agree/agree	543	27.6	768	34.3	1311	31.2
Neutral	399	20.3	522	23.3	921	21.9
Strongly disagree/disagree	1024	52.1	949	42.4	1973	46.9
Total	1966	100	2239	100	4205	100

Results of χ^2 test for trend across the 3 categories of response, comparing men and women's responses:

¹ $\chi^2 = 29.3$, $p < 0.001$

² $\chi^2 = 3.5$, $p = 0.17$

³ $\chi^2 = 40.3$, $p < 0.001$

Results include 60 doctors with an unknown specialty, were unemployed, or not working in medicine.

For peer review only

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of cohort studies

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	4-5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	5
		(b) For matched studies, give matching criteria and number of exposed and unexposed	n/a
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5
Bias	9	Describe any efforts to address potential sources of bias	10-limitations
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	n/a
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	5
		(b) Describe any methods used to examine subgroups and interactions	5
		(c) Explain how missing data were addressed	n/a
		(d) If applicable, explain how loss to follow-up was addressed	5
		(e) Describe any sensitivity analyses	n/a
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6
		(b) Give reasons for non-participation at each stage	6
		(c) Consider use of a flow diagram	n/a
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6
		(b) Indicate number of participants with missing data for each variable of interest	12-13
		(c) Summarise follow-up time (eg, average and total amount)	5
Outcome data	15*	Report numbers of outcome events or summary measures over time	n/a
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	n/a
		(b) Report category boundaries when continuous variables were categorized	n/a
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	n/a
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	6-7
Discussion			
Key results	18	Summarise key results with reference to study objectives	7
Limitations			
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	7-10
Generalisability	21	Discuss the generalisability (external validity) of the study results	10
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	11

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

For peer review only - <http://bmjopen.bmj.com/site/about/guidelines.xhtml>