

# The status of the doctor and variations in the percentage of unfit declarations in medical examinations of shipping and offshore employees in the Netherlands

Casper Baarda<sup>1</sup>, Tom Mutsaerts<sup>2</sup>

<sup>1</sup>Baarda Medical Service/Baarda Medische Keuringen, AC Goes, Netherlands

<sup>2</sup>Netherlands Shipping Inspectorate, The Hague, Netherlands

## ABSTRACT

**Background:** Both shipping medical examinations in 2012–2013 and 2015 and oil and gas offshore medical examinations in 2009–2011 in the Netherlands show a decline in the percentage of declarations of unfitness as the number of examinations performed annually by each physician increases.

**Materials and methods:** The data from the electronic databases for shipping employees 2012–2013 and 2015 and the data collected from doctors examining offshore workers from 2009 to 2011 (based on data from a voluntary questionnaire) were subject to a statistical analysis to be able to assess which variables affect the rate of unfitness declaration.

**Results:** Both shipping and offshore data show a decline in the percentage of declarations of unfitness as the number of examinations performed annually by each physician increases. The shipping examination data suggests that neither the type of physician (family physician, company's physician or other physician) nor the number of years of experience correlates with any trend in the percentage of such declarations. However shipping physicians working as employees had half the percentage of declaration of unfitness when compared to the self-employed physicians. The self-employed physicians, who performed the largest number of examinations per year, had an almost three times lower percentage of declaration of unfitness than the self-employed physicians, who performed few examinations. The percentages of declarations of medical unfitness by physicians working as employees are constant whether they perform many or few examinations per year.

(Int Marit Health 2018; 69, 1: 8–12)

**Key words:** fitness for work, unfit declaration, medical examination, shipping, offshore

## INTRODUCTION

Due to factors including adverse weather, long working days, irregular physical and psychological strain, an often restless working environment and limited access to medical care, workers at sea are at higher risk of an accident. The rate of fatal accidents is higher than in other professions [1–3]. One of the precautions to reduce risks of both accidents and illness while at sea is a mandatory medical examination for all employees working on ships, or on offshore

platforms. In the Netherlands the medical examinations of shipping employees are performed by physicians approved by the Ministry of Infrastructure and Water Management and regulated by law. The examinations of oil and gas offshore installations workers are performed by physicians approved by Netherlands Oil and Gas Exploration and Production Association (NOGEP) and regulated by the trade associations. The examinations analysed were all performed in the Netherlands. Medical fitness criteria are increasingly based

✉ T.C.P.M. Mutsaerts, MD, Netherlands Shipping Inspectorate, The Hague, Netherlands, e-mail: tom.mutsaerts@ilent.nl

on international conventions and recommendations. The main goal is to increase safety by identifying employees with higher health risks, while ensuring that the employment is not limited by declarations of medical unfitness.

In 2012 the medical adviser for NOGEPa investigated the numbers of declarations of medical fitness or unfitness [4]. The physicians who performed 0–100 examinations a year were almost five times as likely to declare someone medical unfit (1.41%) when compared to physicians who performed over 400 examinations per year (0.28%) (Table 1: Offshore 2009–2011). To enable comparison with the data of seafarers the groups 0 to 50 and 51 to 100 have been merged). Note that these findings are based on a voluntary questionnaire with a response of only 86 of the 188 physicians contacted. In this sample the percentages of declared medical unfit decreased progressively in each group as the number of examinations per year increased (0–100: 1.41% 100–200: 0.4%, 200–400: 0.29%, > 400: 0.28%).

## MATERIALS AND METHODS

The association between the number of examinations a physician performed each year and the percentage of declarations of medical unfitness was investigated for shipping medical examinations performed in 2012–2013 (Table 2). This information is delivered anonymously (both for the person examined and for the examining physician) to the Netherlands Shipping Inspectorate. As all results of the examinations were gathered from an electronic database (“ShipExam”), the response rate was 100%. The findings of this research and the NOGEPa data for 2012 were the basis for follow-up research of both offshore and shipping medicals during the year 2015 (Table 2).

The medical adviser of NOGEPa asked the offshore medical examiners for their data: the age of the examined persons, their numbers of fit and unfit declarations and the reason for declaring workers unfit for the year 2015. The examinations for shipping in 2015 were explored in the same way: using the data from ShipExam. For this year’s examinations for shipping we also looked at the association with the following parameters: type of doctor (company physician, family physician or other physician), and whether they were employed or self-employed (Table 3). All these data were tabulated. For the statistical analysis, the chi square test was used.

## RESULTS

The offshore results for 2015 again showed the same trend: the more examinations a physician perform each year, the lower is the percentage of declarations of medical unfitness. Because of the low response rate, with less than 50% of doctors participating, these data have not been used for further analyses and were not added to the tables.

Table 1 gives the results for the offshore workers for the years 2009–2011. Table 2 shows the results for shipping workers for the years 2012–2013. Table 3 presents the results for shipping workers in 2015. For all these periods of time the associations between percentages of declaration of medical unfitness and numbers of examinations per year have been analysed.

For shipping (Tables 2 and 3) the connection with other parameters for both periods of time was also examined, namely: type of physician (company physician, family physician, other types of physicians), time of authorisation to act as a seafarer medical examiner (before 2001 or after 2001). For the year 2015 (Table 3) the doctor’s employment status (as employee or self-employed) was also examined. These data were collected from the electronic database ShipExam with 100% response rate.

The data from both offshore 2009–2011 and shipping 2015 medicals show a statistically significant trend: the higher the number of examinations per year the physician performs, the lower is the percentage of declaration of medical unfitness (Tables 1 and 3).

The percentage of declarations of medical unfitness issued by family physicians and company’s physicians in shipping in 2012–2013 is nearly the same (Table 2: For shipping employees examined in 2012–2013, this percentage was lower when medicals were performed by physicians who were not qualified in any medical speciality; however, this was a small group of nine physicians and therefore general conclusions can’t be drawn).

Other parameters for shipping medical examinations in 2015 that were analysed for percentage of unfitness declarations indicate (Table 3):

- Little difference between company’s physicians and family physicians.
- No difference between physicians who started performing examinations before 2001 and those who started more recently.
- The percentage of declarations of medical unfitness by self-employed physicians was nearly twice as high as in physicians working as employees. The difference is statistically significant.
- Both company’s physician and family physicians have a remarkably higher percentage of unfit declarations, if they were self-employed.
- The percentages of declarations of medical unfitness by physicians working as employees were constant, whether they perform many or few examinations per year.
- Self-employed physicians, who perform few medical examinations per year, showed a nearly three times higher percentage of declarations of medical unfitness than self-employed physicians who perform many medical examinations per year. The difference is significant.

**Table 1.** Percentages of declarations of medical unfitness for offshore 2009–2011 analysed by numbers of examinations per year

Number of examinations per physician per year	Number examined	Number unfit	Percentage
<i>Significant: Chi-k: <math>p \leq 0.0001</math></i>			
1–100 (physicians n = 76)	2121	30	1.41%
100–200 (physicians n = 5!)	675	2.7	0.40%
200–400 (physicians n = 3!)	793	2.3	0.29%
> 400 (physicians n = 2!)	1786	5	0.28%

Statistical assessment with Chi-squared test (Chi-k)

**Table 2.** Percentages of declarations of medical unfitness for shipping in 2012–2013, analysed by numbers of examinations per year, type of physician and duration of approval by maritime authorities

Number of examinations per physician per year	Number examined	Number unfit	Percentage
<i>Just trend: Chi-k. <math>p = 0.27</math></i>			
1–100 (physicians n = 19)	1449	17	1.17%
100–200 (physicians n = 29)	4203	47	1.12%
200–400 (physicians n = 24)	6498	66	1.02%
> 400 (physicians n = 19)	14161	120	0.85%
Declarations of unfitness per group of physicians	Number examined	Number unfit	Percentage
<i>Chi-k: <math>p = 0.0317</math></i>			
Company's physicians (physicians n = 33)	8554	86	1.01%
Family physicians (physicians n = 48)	13043	135	1.04%
Other physicians (physicians n = 9!)	4714	29	0.62%
Duration of approval for a longer term (before 2002) or short term (after 2002)	Number examined	Number unfit	Percentage
<i>Nearly no difference</i>			
Registration $\leq$ 2001 (physicians n = 46)	17056	162	0.950%
Registration $\geq$ 2002 (physicians n = 45)	9255	88	0.951%

Statistical assessment with Chi-squared test (Chi-k)

## DISCUSSION

Uniform regulations should mean that the chance of a shipping or offshore worker being declared medically fit or unfit will be consistent irrespective of the examining physician. However, the results presented show that this is not the case. Differences in interpretation of and compliance with the medical standards and differences in the population presenting to each doctor could explain this variation. Shipping and offshore workers can often decide which doctor to attend and may well hear from colleagues about those who are thought to give fit certificates most readily and then chose to go there. This study suggests that both the number of medical examinations per year and whether or not the doctor is employed, influence the outcome of the examinations. These findings are replicated in both shipping and offshore workers over several years.

In 2012, Rustom and Carter [5] published a study on the differences in unfit declarations of approved doctors

and medical referees in the United Kingdom. Important differences in the percentage of unfit declarations were identified. They suggested that one of the possible causes of the differences could be due to the experience and knowledge of the approved doctors.

Our study investigated whether the differences of unfit declarations could be explained by increased experience among the physicians who perform many examinations. If experience was relevant, it could be expected that physicians who had been performing such examinations for a long time, would issue fewer declarations of unfitness than recently appointed medical examiners. This was the case.

An explanation of the statistically significant finding that the percentage of declarations of medical unfitness issued by self-employed physicians were nearly twice as high as in physicians working as employees could be that physicians who are employed, experience greater time pressure to comply with the expected commercial output and

**Table 3.** Percentages of declarations of medical unfitness for shipping 2015, analysed by numbers of examinations per year, type of physician and working as employee or as self-employed

Number of examinations per physician per year	Number examined	Number unfit	Percentage
<i>Significant: Chi-k: <math>p \leq 0.0001</math></i>			
1–100 (physicians n = 48)	3260	48	1.47%
100–200 (physicians n = 31)	3985	31	0.78%
200–400 (physicians n = 36)	4437	36	0.81%
> 400 (physicians n = 19)	5339	19	0.36%
Declarations of unfitness per group of physicians	Number examined	Number unfit	Percentage
<i>Small difference</i>			
Company's physicians (physicians n = 37)	4359	33	0.76%
Family physicians (physicians n = 47)	5052	43	0.85%
Other physicians (physicians n = 47)	7381	55	0.75%
Type of employment	Number examined	Number unfit	Percentage
<i>Significant: Chi-k: <math>p = 0.0165</math></i>			
Employed by a healthcare company (physicians n = 31)	5229	29	0.55%
Employed by a clinic (physicians n = 3!)	1103	5	0.45%
Self-employed (physicians n = 78)	10689	100	0.94%
Declarations of unfitness per group of physicians and type of employment	Number examined	Number unfit	Percentage
Physicians employed (physicians n = 31)			
Company's physicians (physicians n = 19)	3208	11	0.34%
Family physicians (physicians n = 4!)	1071	4	0.37%
Other physicians (physicians n = 8!)	950	14	1.47%
Self-employed physicians (physicians n = 76)			
Company's physicians (physicians n = 18)	1527	18	1.18%
Family physicians (physicians n = 43)	6530	44	0.67%
Other physicians (physicians n = 15)	2402	37	1.54%
Employed and self-employed, less or more than 100 examinations a year	Number examined	Number unfit	Percentage
<i>Employed: nearly similar</i>			
1–100 (physicians n = 15)	904	5	0.55%
> 100 (physicians n = 19)	5428	29	0.53%
<i>Self-employed: significant: Chi-k: <math>p = 0.0001</math></i>			
1–100 (physicians n = 45)	2356	43	1.83%
> 100 (physicians n = 33)	8333	57	0.68%

Statistical assessment with Chi-squared test (Chi-k)

so try to avoid unfitness declarations, because of the time and work it takes to issue an unfit declaration. It's also possible that the self-employed physicians see different populations for examination. Family physicians are more often self-employed than company's physician (Table 3: Declarations of unfitness per group of physicians and type of employment). However, this cannot explain the difference between self-employed physicians and physicians working as employees. The percentage of declarations of unfitness for both company physician and family physicians but also

for "other physicians" is higher if they are self-employed. (Table 3: Declarations of unfitness per group of physicians and type of employment).

The 2013 guidelines for both shipping and offshore workers include some criteria with clear limits for fit or unfit declarations (e.g. hearing and vision), but also for many conditions there are no such limits [6, 7]. For example the Dutch regulations in 2006 and earlier stated that the seafarer had to be fit enough to be able to climb stairs, keep watch etc. In the Netherlands, the shipping employees are

required to attend maritime training, several times during their career. However, trainers informed the medical adviser to the maritime authority, that there were many shipping employees who had trouble completing their training, because of their bad condition, despite being recently certificated as fit. This prompted the medical advisor to investigate whether it is possible to measure the condition reliably during the medical examination by means of a step test, which is easy to perform, and where clear limits can be set for physical capability.

A recent systematic review of 23 studies in 12 countries shows marked international differences between insurance physicians when judging fitness for work. On the other hand the differences between Dutch insurance physicians are small. The explanation for this is that Dutch insurance physicians work within well specified standards. Standardisation was advised for all insurance medicals. The authors remarked that “judging is always an activity at crosslines of objectivity and subjectivity” [8].

## CONCLUSIONS

Well-constructed regulations, national registration of the outcome of medical examinations and regular training for examining doctors, especially case discussions, have the potential to diminish the variations in the percentage of unfit declarations. The shipping medical examiners in the Netherlands are obliged to attend a yearly schooling programme. The recently revised International Labour Organisation/International Maritime Organisation (ILO/IMO) regulations for seafarer medical examinations are more

comprehensive and detailed than the former guidelines. Hopefully, this will result in more uniformity, when they are adopted as the basis for national regulations.

## REFERENCES

1. Roberts SE, Marlow PB. Traumatic work related mortality among seafarers employed in British merchant shipping, 1976-2002. *Occup Environ Med.* 2005; 62(3): 172–180, doi: [10.1136/oem.2003.012377](https://doi.org/10.1136/oem.2003.012377), indexed in Pubmed: [15723882](https://pubmed.ncbi.nlm.nih.gov/15723882/).
2. Jensen OC, Sørensen JFL, Canals ML, et al. Non-fatal occupational injuries related to slips, trips and falls in seafaring. *Am J Ind Med.* 2005; 47(2): 161–171, doi: [10.1002/ajim.20119](https://doi.org/10.1002/ajim.20119), indexed in Pubmed: [15662643](https://pubmed.ncbi.nlm.nih.gov/15662643/).
3. Zevallos J, Hulshof CT, Mutsaerts T, et al. Outcomes of seafarer work fitness qualifications in the Netherlands. *Occup Med (Lond).* 2014; 64(4): 267–270, doi: [10.1093/occmed/kqu020](https://doi.org/10.1093/occmed/kqu020), indexed in Pubmed: [24604102](https://pubmed.ncbi.nlm.nih.gov/24604102/).
4. Tuinman CP. Number of offshore medicals performed p.a. and percentages of failures. Yearly conference Nogepe examination physicians. The Netherlands 14-06-2012.
5. Rustom I, Carter T. Do approved doctors and medical referees in the UK agree when assessing a seafarer's fitness? *Int Marit Health.* 2012; 63(2): 71–77, indexed in Pubmed: [22972546](https://pubmed.ncbi.nlm.nih.gov/22972546/).
6. International Labour Organization and International Maritime Organisation 2013. Guidelines on the medical examinations of seafarers. Geneva 2013. [http://www.ilo.org/wcmsp5/groups/public/-ed\\_dialogue/-sector/documents/normativeinstrument/wcms\\_174794.pdf](http://www.ilo.org/wcmsp5/groups/public/-ed_dialogue/-sector/documents/normativeinstrument/wcms_174794.pdf).
7. Industry Guideline nr 15 – Guidance for Offshore Medical Examinations Version 2. <https://www.onsaardgas.nl/wp-content/uploads/2016/08/Guideline-15-EN-Offshore-Medical-Examination-02-2013.pdf> (13-02-2013).
8. Barth J, de Boer WEL, Busse JW, et al. Inter-rater agreement in evaluation of disability: systematic review of reproducibility studies. *BMJ.* 2017; 356: j14, doi: [10.1136/bmj.j14](https://doi.org/10.1136/bmj.j14), indexed in Pubmed: [28122727](https://pubmed.ncbi.nlm.nih.gov/28122727/).