

Chapter 2.5: Effects of work on health: Physical demands and Ergonomics

Dr P Paul FM Kuijer, p.p.kuijer@amc.nl, , <http://www.amc.nl/web/Research/Who-is-Who-in-Research/Who-is-Who-in-Research.htm?p=1398>, consultant on work-related musculoskeletal disorders, Coronel Institute of Occupational Health, Academic Medical Center / University of Amsterdam, the Netherlands, last updated 28/08/2012

Self-assessment exercises

The following questions are for self-assessment. Multiple choice questions with three possible answers are provided: there is only ONE correct answer.

Question 1: Waste collection and physical job demands

Identify the physical job demands in the workplace of a Dutch waste collector collecting bags during the working day. Imagine what sort of physical job demands might exist for a waste collector collecting bags on the street. The picture below may help you. FYI: A Dutch waste collector lifts on average 14 kg per lift (one bag of about 7 kg in each hands), collects bags for about 3:30 hrs a day, sits in the garbage truck for about 1 hrs a day, collects in total about 1400 bags a day with a total mass of about 10000 kg.



Identify the most physically demanding activity for the waste collector in terms of a risk factor for non-specific low back pain

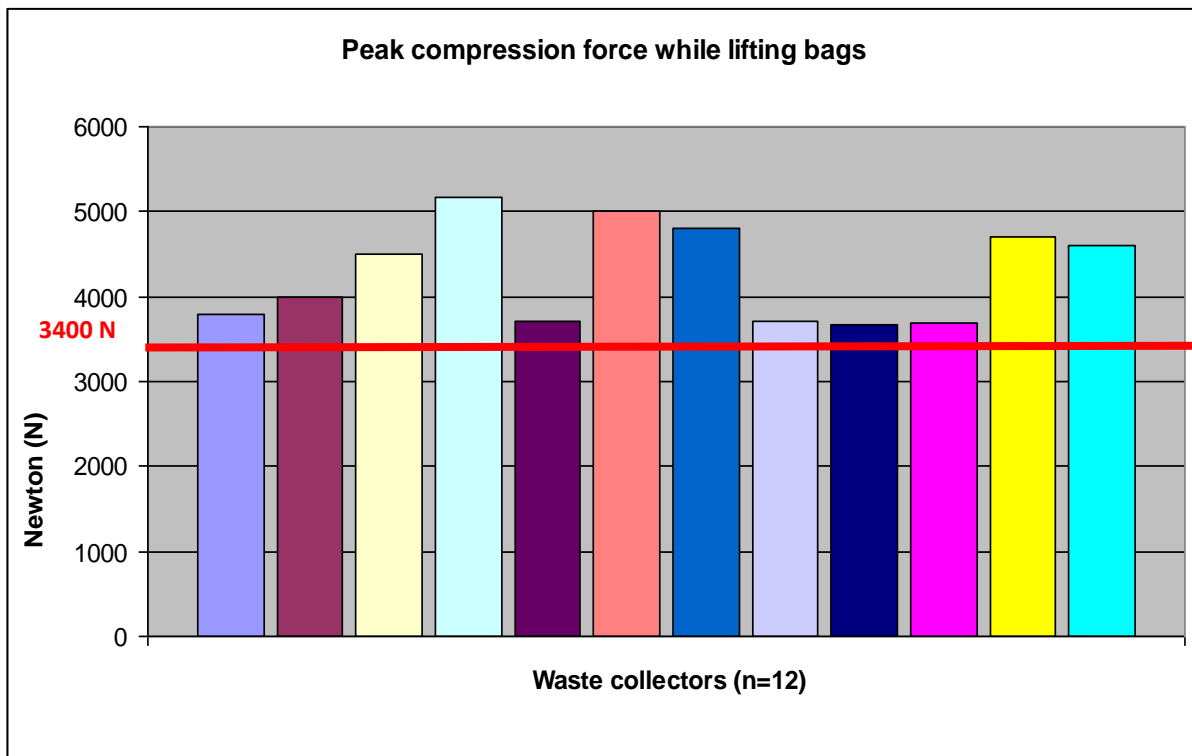
Answer a: lifting and carrying of bags

Answer b: sitting in the truck while being exposed to whole body vibration.

Answer c: walking behind the truck looking for bags.

Question 2 : Biomechanical load on the back

To get a better insight in the physical workload of waste collectors, a laboratory study is performed to assess the workload in terms of biomechanical load on the low back (compression force). In this study 12 waste collectors performed lifting of bags in the laboratory and the researchers measured the hand forces and the body postures and movements. Based on these data and the anthropometric characteristics of the 12 waste collectors like body weight and body length, the highest (peak) compression force on the low back was calculated during the lifting of the bags for each of the 12 waste collectors .



What conclusion can NOT be drawn based on the presented data?

Answer a : the compression force on the low back are on average 2600 Newton

Answer b : the compression force exceeded 5000 Newton

Answer c : all workers are at risk for the development of low back pain

Question 3: Work-related non-specific low back pain or not?

Paul, 45 years old, works as a driver of a waste collecting truck. He is on sick leave for one week due to non-specific low back pain. He works in a team of three: the other two teammates manually collect the bags. Paul is doing this work for more than 6 years. Before this job, he worked as a truck driver transporting flowers back and forth from the Netherland to Italy. To have a more regular work schedule, Paul changed his job. Paul drives a Mercedes Garbage truck during about 6 hours a day. The following link shows this truck and the corresponding level of vibration during a working day dependent on the driving time:

<http://www.ispesl.it/vibrationdatabase/documenti/leggiDett.asp?lang=en&quale=134>

Calculate the attributable fraction due to work-related risk factors for non-specific low back pain using the 3 step model as presented in paragraph 2.1 for Paul's present job?

Answer a: 0%

Answer b: 7%

Answer c: 18%

Question 4: Preventive measures at the worksite

Identify effective ergonomic measures in waste collecting to reduce the risk of low back complaints

What are effective preventive measures to reduce the risk of low back pain in waste collectors handling bags

Answer a: Training in proper lifting techniques

Answer b: Replacing bags and bins with two wheeled containers

Answer c: Weight program at work until Body Mass Index < 25