

# How to reduce Covid-19 risks by working time / shift work scheduling

## The aims:

1. Reducing exposure to infectious persons
2. Minimizing the consequences of infection
3. Reducing risk of exhaustion/fatigue that may lead to errors/accidents and may also weaken the immune system

## Version 0.2

Area	Ideas
<b>General</b>	<b>Increase the days with home office, shorten others.</b>
	If possible, adopt (by consensus!) part-time work (e.g. for elderly worker, parents, ...) or hire staff to have more reserves for absences.
	Extend the hours of the flexitime framework (e.g. change from 7:00-18:00 to 5:00-23:00) to allow for reducing contacts.
	Build up personnel reserves and distance support to avoid potentially infectious persons coming in because "they are needed".
	In crucial situations, isolate people within the company (or from their loved ones– e.g. sleeping in the basement) – e.g. for several weeks.
	Instead of paying additional supplements for the risks, hiring more persons reduces individual risks and unemployment.
<b>Travel to work</b>	Consider longer shifts – if not too exhausting. <sup>i</sup>
	Minimize carpooling, especially if it mixes work-teams.
	<b>Assign a variety of start-, break and end times to reduce the number of contacts and persons in the cloakrooms/washrooms, canteen ...</b>
<b>Shift work</b>	Build more shift groups in order to have reserves. Consider the training of additional employees for further backup.
	In continuous shift patterns reduce the number of teams and people scheduled per day, i.e. by <ul style="list-style-type: none"> <li>• extended shift length as far as reasonably possible if work is not too exhausting</li> <li>• unmanned times in automated processes</li> <li>• reducing the number of people scheduled to the critical minimum (if workload is low)</li> </ul>
	<b>Avoid contact between shift groups and try to make them as small as possible.</b> <i>Teams of 6 people working closely together have roughly 5 times the risk of 3 teams of 2 people each.<sup>ii</sup></i>
	No overlapping shift changes (if possible, start the next shift some time after the end of the last) - (electronic) logbooks/information boards.
	Consider on-call-duties as "back-up shifts" (to have an immediate replacement available)
<b>Work organisation</b>	Healthcare ...: Fixed assignment of employee group to patients to avoid cross-infection.
	Find/assign a fellow worker to be a buddy for checking on how each of you are coping and to watch for signs and symptoms of fatigue in yourself and co-workers (e.g., yawning, difficulties in concentrating, emotional instability, flawed logic, poor communication). <sup>iii</sup>
	Organise canteen visits to minimize contacts between clients, e.g. schedule small groups to eat at the same time, serve packed lunches only, ...
<b>Exhaustion /fatigue</b>	<b>Avoid fatigue and increase hygiene compliance with frequent breaks, e.g. every two hours<sup>iv</sup>.</b>
	Ensure enough rest between shifts (ideally more than 11 hours) and between stretches of shifts (at least 36 hours). Avoid long stretches of night work. <sup>v</sup>
	Consider workload and error consequences in shift length. <i>Example: 2-hour shifts for intensive care South Korea<sup>vi</sup></i>

## Authors:

Arlinghaus, Anna [arlinghaus@ximes.com](mailto:arlinghaus@ximes.com)

Baumgartner, Peter [baumgartner@ximes.com](mailto:baumgartner@ximes.com)

Folkard, Simon [s.folkard@swansea.ac.uk](mailto:s.folkard@swansea.ac.uk)

Gärtner, Johannes [gaertner@ximes.com](mailto:gaertner@ximes.com), [Johannes.gaertner@tu-wien.ac.at](mailto:Johannes.gaertner@tu-wien.ac.at)

Wendsche, Johannes [Wendsche.Johannes@baua.bund.de](mailto:Wendsche.Johannes@baua.bund.de)

Wong, Imelda (CDC/NIOSH/DSI/SSTRB) [kwn0@cdc.gov](mailto:kwn0@cdc.gov)

- 
- i Reduces risks of traveling by 1/3. Helps to deal with quarantine of one group.
  - ii If persons work close together one infectious person may infect 5 others in a team of 6, but only 1 in a team of two. For small risks (e.g. 1/100) the probability of two or more persons being infected at the same time is very low. Therefore, the probability is approx. 5 times that of 3\*2 teams.
  - iii [https://blogs.cdc.gov/niosh-science-blog/2020/04/02/fatigue-crisis-hcw/?deliveryName=USCDC\\_170-DM24834](https://blogs.cdc.gov/niosh-science-blog/2020/04/02/fatigue-crisis-hcw/?deliveryName=USCDC_170-DM24834)
  - iv Dai H, Milkman KL, Hofmann DA, Staats BR. The impact of time at work and time off from work on rule compliance: the case of hand hygiene in health care. *J Appl Psychol.* 2015;100(3):846–862. doi:10.1037/a0038067
  - v Dorothee Fischer, David A. Lombardi, Simon Folkard, Joanna Willetts & David C. Christiani (2017): Updating the "Risk Index": A systematic review and meta-analysis of occupational injuries and work schedule characteristics, *Chronobiology International*, DOI: 10.1080/07420528.2017.1367305
  - vi <https://www.bbc.com/news/av/world-asia-52046339/coronavirus-inside-a-covid-19-intensive-care-unit>