

Why direct observation is not often objective?

Our last post addressed the [Hawthorne effect](#), which refers to the tendency of people behaving differently when they know that they are being observed. In IPC, this leads to the overestimation of the hand hygiene compliance values [1]. Unfortunately, the Hawthorne effect is not the only bias, that can modify the results of direct observation of hand hygiene. We describe now a few more.

Observer bias is often confused with the Hawthorne effect or observer effect, but it is quite different. While the Hawthorne effect describes the change of the observed person's behavior, the observer bias is independent from the subject. [Dhar et al. 2010](#) compared compliance rate reported by unit-based observers, people who worked the same unit as the HCW and compliance – reported by non-unit-based observers. The study was carried out at 19 units at two hospital in Michigan, in 2008. They found that while non-unit-based observers reported **59%** hand hygiene compliance, this number was significantly higher, **79%** as reported by unit-based observers. They concluded that unit-based observers might be overestimating hand hygiene compliance [2].

Human observation is often **unreliable**, as found by [Sharma et al. 2012](#). They observed hand hygiene events by automated systems, and also by human observation. Dispensers were modified to broadcast a radio transmission each time the dispenser was used. Each door was equipped with an infrared beam and an instrument that records the interruption of the infrared beam each, indicating that someone went in or out the room. Then, a human observer was sat at the end of the clinic hallway and asked to record each time when healthcare-workers (HCW) entered or exited a room, and whether or not these HCW used the dispenser. They recorded 1400 hand hygiene events, and found that in 38% of the events recorded by human observer and by the electronic system differed (e.g., the person entered a different room, not used the dispenser, etc.). Clinic crowding and observer's distance from the observed event were significant predictors of inconsistencies [3].

Selection bias can affect studies due to non-randomized enrollment of participants. Most of the studies based on voluntary participation, thus they are not representative. [4]. Direct human observation is labor intensive and costly, therefore only a small section of HCW can be observed. It often provides information for only a small sample (1–3%) of all hand hygiene opportunities occurring in healthcare settings [1].



Published rates of hand hygiene compliance vary from 5% to 81% [2]. This wide range can be explained by the effect of all the above-mentioned bias and the Hawthorne effect.

Currently, direct observation of hand hygiene by trained observers is considered as the gold standard for determining hand hygiene compliance rate. Direct observation is time-consuming and – as explained – have shortcomings [5].

Electronic monitoring systems can record a large number of hand hygiene events, therefore they can eliminate the selection bias. These can record a large amount of data in a reliable way, and also eliminate the observer bias [1]. Electronic systems can reduce the Hawthorne effect, and continuous monitoring can have positive effect to HCW behavior [4].

Why is the direct observation being still the gold standard? According to [Boyce 2011](#), it is the only strategy that can provide detailed information about hand hygiene technique [5]. The [Simmelweis Scanner](#) is a new generation electronic monitoring system, which can assess the hand hygiene technique. It combines the advantages of the direct observation and the electronic monitoring systems in certain setups.

Conclusion:

Direct observation is often referred to as the gold standard of monitoring hand hygiene compliance. It has several limitations; it is labor-intensive, time-consuming and expensive. Besides that, direct observation may be distorted by the Hawthorne effect, observer bias and selection bias. The only advantage of the direct observation was the capability to monitor hand hygiene technique. Electronic monitoring systems eliminate the shortcomings of the direct observation. The [Simmelweis Scanner](#) is also able to monitor hand hygiene technique, so it keeps the advantage of the direct observation and complete it with the objectivity of the electronic systems.

References

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