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Presenteeism or not presenteeism, that is the question



Presenteeism due to illness is defined as work attendance despite being ill and is considered a public health problem. Researchers of the UAB reviewed the analytical methodology of the problem, and have proposed a new methodology that could be used in a range of different applications such as quality control, epidemiology, medicine, or risk management, among many others.

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Sickness presenteeism (SP) is defined as the fact of attending the workplace despite being ill, and it should be considered an important public health issue due to its association with a range of health problems, with future episodes of sickness absence; furthermore, it has important implications for employing organizations, and theory in the domain of attendance at work. On reviewing the literature, a UAB research group have observed that most studies estimating 'prevalence' of SP do so on the working population not excluding the 'healthy' workers, who, by definition, are not at risk for SP. In such cases, the population is made up, among others, of workers who are not presenteeists because they have never been sick and workers who, having been sick, did not attend their workplace. Note that the difference is important: roughly the first situation informs us exclusively about the status of health, the second about the exercise of the right to take a sick leave. Analyzing these data in the classical way without taking this difference into account might lead to biased conclusions.

The specific sample (n=1564 workers) has a proportion of $\omega=0.39$ individuals that were ill at least once within the study period (and therefore were at risk of being presenteeists) and, among them, a proportion of $p=0.70$ who actually were presenteeists. The proposed

mathematical model is capable of correctly identifying both sources of 'zeros': Its estimates are 0.37 and 0.74 for ω and p respectively, while the usual approach would yield a proportion of presenteeists of 0.27 among the workers on this sample, as the only observable parameter of the model is the product of both, i.e. $\omega \cdot p$.

In general, zero-inflated models are aimed to addressing the problem that arises from having two different sources that generate the zero values observed in a distribution. In practice, this is because the studied population actually consists of two subpopulations: one in which the value zero is by default (called structural zero) and the other is circumstantial (called sample zero). Our model is focused on phenomena that can only take two values (true or false, occurrence or not occurrence) and is able to incorporate previous knowledge we might have about the parameters of interest.

The proposed methodology could be used in a range of different applications like quality control, epidemiology, medicine or risk management among many others and it is implemented in the form of a package (BayesZIB) that can be installed in a very powerful and popular statistical software called R.

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References

Morriña, D., Puig, P. & Navarro, A. **Analysis of zero inflated dichotomous variables from a Bayesian perspective: application to occupational health.** *BMC Med Res Methodol* 21, 277 (2021). doi: [10.1186/s12874-021-01427-2](https://doi.org/10.1186/s12874-021-01427-2)

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