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Letter to the editor

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* Torshizi F, Honarvar M, Rahimarbabi E, Sheikh M, Hajiebrahimi M, Behnampour N. Incidence and treatment outcomes of pulmonary tuberculosis in Islamic Republic of Iran. East Mediterr Health J. 2023;29(6):417–424. https://doi.org/10.26719/emhj.23.047

Dear Editor,

We read the valuable manuscript entitled: “Incidence and treatment outcomes of pulmonary tuberculosis in Islamic Republic of Iran” published in EMHJ (1). The authors said: “This was a cross-sectional study of notification data from Golestan Province between 2014 and 2019. The records of eligible patients were reviewed from diagnosis to the treatment outcomes of interest or end of study. The treatment outcomes of interest were based on WHO definitions: cured and treatment completed were categorized as a successful treatment; treatment failure, loss to follow-up, and died were categorized as unsuccessful treatment.” In the analysis they said: “The cumulative incidence by sex and the residence (urban/rural) of the smear-positive pulmonary tuberculosis patients was calculated by the formula: number of cases/total population × 100 000. The relative risk to compare the incidence by sex and residence was calculated using the formula: cumulative incidence in males/cumulative incidence in females, and cumulative incidence in rural patients/cumulative incidence in urban patients.”

There are several issues with the study. The cumulative incidence or risk and different outcomes can be measured during a longitudinal study such as cohort studies (2,3), while in cross-sectional studies, exposure and outcome are measured at the same time and there is no follow-up to determine the new cases and outcome (3). Although the authors have described the type of study as cross-sectional, they have used measures of association indices of cohort studies (cumulative incidence, relative risk). In cross-sectional studies, the point prevalence rate ratio is often used to assess associations. The ability of the point prevalence ratio to estimate the relative risk is a function of the relationship between incidence and point prevalence:

Point prevalence: Incidence × Duration × (1 – Point prevalence)

Using the notations “Prev” for point prevalence, “q” for incidence, and “Dur" for duration and denoting the presence or absence of a given exposure by "+" or "–," the point prevalence rate ratio (PRR) can be formulated as follows (4):

Because one of the components of this formula (q+/q–) is the relative risk, this equation can be written as follows (4):

In rare diseases that have short duration, PRR will be equal to RR (4).

Based on these, therefore, it seems that the type of study is not in accordance with the method

of analysis mentioned in the study.

References

1. Torshizi F, Honarvar M, Rahimarbabi E, Sheikh M, Hajiebrahimi M, Behnampour N. Incidence and treatment outcomes of pulmonary tuberculosis in Islamic Republic of Iran. East Mediterr Health J. 2023;29(6):417–424. https://doi.org/10.26719/emhj.23.047.
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Response by statistician

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In a cross-sectional sampling study, it is possible to calculate all probabilities required for estimating every epidemiological measures of associations such as incidence, prevalence, cumulative incidence, etc. In other words, in cross-sectional studies, sampling is a joint sampling of the joint distribution of exposure (E) and disease (D) by which it is possible to calculate joint, marginal and conditional probabilities required to estimate relative risk, odds ratio, excess risk, attributable risk, etc. These estimates can be found for every specific time point of a cohort or case-control study. Of course the results of a cross-sectional study are estimations of true values at a specific time point or in a short period.

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