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Case fatality models for epidemics in growing populations. (English) Zbl 1348.92152
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Summary: The asymptotically homogeneous SIR model of *H. R. Thieme* [ibid. 111, No. 1, 99–130 (1992; [Zbl 0782.92018](#))] for growing populations, with incidence depending in a general way on total population size, is reconsidered with respect to other parameterizations that give clear insight into epidemiological relevant relations and thresholds. One important feature of the present approach is case fatality as opposed to differential mortality. Although case fatality models and differential mortality models are equivalent via a transformation in parameter space, the underlying ideas and the dynamic behaviors are different, e.g. the basic reproduction number depends on differential mortality but not on case fatality. The persistent distributions and exponents of growth of infected solutions are computed and discussed in terms of the parameters. The notion of asymptotically exponentially growing state (as opposed to stationary state or exponential solution) coined by Thieme is interpreted in terms of stability theory. Of some interest are limiting cases of models without recovery where two infected solutions exist.

MSC:

[92D30](#) Epidemiology
[92D25](#) Population dynamics (general)

Cited in 4 Documents

Keywords:

[epidemic model](#); [case fatality](#); [growing population](#); [asymptotically homogeneous system](#); [basic reproduction number](#); [stability](#)

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