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J. M. Cushing* (cushing@math.arizona.edu), Department of Mathematics, 617 N Santa Rita, University of Arizona, Tucson, AZ 85719, and **A. S. Ackleh**, Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70504. *The Net Reproductive Number R_0 for Periodic Matrix Models of Structured Population Growth.*

We define the net reproductive number R_0 for a linear periodic matrix model by providing an appropriate additive decomposition of the projection matrix of the composite map. This definition leads to a straightforward generalization of the standard definition of R_0 for autonomous matrix equations and its biological interpretation. It is shown that the Cushing-Yicang theorem holds, i.e., that R_0 and r (the inherent growth rate of the periodic map) lie on the same side of 1. We compare our definition with another definition given recently in the literature and show that they are not in general equal. This fact can lead to not only to different estimates for a population's net reproductive number R_0 , but to different (even opposite) conclusions from a sensitivity analysis performed on R_0 . (Received September 13, 2010)