

**CORRECTION**

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# Correction to: Studies on the basic reproduction number in stochastic epidemic models with random perturbations

Andrés Ríos-Gutiérrez<sup>1</sup>, Soledad Torres<sup>2</sup> and Viswanathan Arunachalam<sup>1\*</sup>

The original article can be found online at <https://doi.org/10.1186/s13662-021-03445-2>

\*Correspondence:  
[varunachalam@unal.edu.co](mailto:varunachalam@unal.edu.co)

<sup>1</sup>Department of Statistics,  
Universidad Nacional de Colombia,  
Bogotá, Colombia

Full list of author information is  
available at the end of the article

## 1 Correction

Following publication of the original article [1], some errors in the equations were found in the article due to the typesetting mistakes:

On page 7,

$$\mathcal{L}(W(t)) = f^T \frac{\partial V}{\partial x} + \frac{406}{2} g^T \frac{\partial V}{\partial x} g \leq \lambda_1 a(t) + \lambda_2 b(t) + \lambda_3 c(t)$$

should be

$$\mathcal{L}(W(t)) = f^T \frac{\partial V}{\partial x} + \frac{1}{2} g^T \frac{\partial V}{\partial x} g \leq \lambda_1 a(t) + \lambda_2 b(t) + \lambda_3 c(t).$$

On page 12,

$$\lim_{l \rightarrow +\infty} B(l) e^{-(\mu+\gamma)l} = B(0) - (\mu + \gamma) \int_0^{+\infty} B(a) e^{-(\mu+\gamma)a} da + \int_0^{+\infty} e^{-(\mu+\gamma)a} dB(a)$$

should be

$$\lim_{l \rightarrow +\infty} B(l) e^{-(\mu+\gamma)l} = B(0) - (\mu + \gamma) \int_0^{+\infty} B(a) e^{-(\mu+\gamma)a} da + \int_0^{+\infty} e^{-(\mu+\gamma)a} dB(a).$$

On page 15,

$$\frac{\sigma Z_{\alpha/2} + \bar{R} \sqrt{2n\beta} \sqrt{(\mu+v)(\mu+\gamma)}}{\bar{R} \sqrt{2n\beta} \sqrt{(\mu+v)(\mu+\gamma)}} < \frac{945}{R_0^{\text{SIR}}} < \frac{\sigma Z_{1-\alpha/2} + \bar{R} \sqrt{2n\beta} \sqrt{(\mu+v)(\mu+\gamma)}}{\bar{R} \sqrt{2n\beta} \sqrt{(\mu+v)(\mu+\gamma)}}$$

should be

$$\frac{\sigma Z_{\alpha/2} + \bar{R} \sqrt{2n\beta} \sqrt{(\mu+v)(\mu+\gamma)}}{\bar{R} \sqrt{2n\beta} \sqrt{(\mu+v)(\mu+\gamma)}} < \frac{1}{R_0^{\text{SIR}}} < \frac{\sigma Z_{1-\alpha/2} + \bar{R} \sqrt{2n\beta} \sqrt{(\mu+v)(\mu+\gamma)}}{\bar{R} \sqrt{2n\beta} \sqrt{(\mu+v)(\mu+\gamma)}}.$$

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On page 18,

$$\frac{1}{(\mu + \nu)(\mu + \gamma)} \left( \frac{\eta N}{2\mu} + \frac{1}{\sigma g} \right) \leq E(R_{0,\nu}^{\text{SEIRS}}) \leq \frac{1}{(\mu + \nu)(\mu + \gamma)} \left( \frac{\eta N}{2\mu} + \frac{1}{\sigma l} \right) \quad (4.4)$$

should be

$$\frac{\nu\beta}{(\mu + \nu)(\mu + \gamma)} \left( \frac{\eta N}{2\mu} + \frac{1}{\sigma g} \right) \leq E(R_{0,\nu}^{\text{SEIRS}}) \leq \frac{\nu\beta}{(\mu + \nu)(\mu + \gamma)} \left( \frac{\eta N}{2\mu} + \frac{1}{\sigma l} \right). \quad (4.4)$$

On page 21,

$$\frac{\partial W}{\partial I(t)} = \lambda_2 (\nu E + (\mu + \nu)I) y \frac{\partial W}{\partial R(t)} = \lambda_4 R$$

should be

$$\frac{\partial W}{\partial I(t)} = \lambda_2 (\nu E + (\mu + \nu)I), \quad \frac{\partial W}{\partial R(t)} = \lambda_4 R.$$

On page 23,

$$V(S(t), I(t), R(t)) := \lambda_1 \left( \frac{\eta}{\mu} N - S(t) \right)^2 + \lambda_2 \frac{1}{2} I^2(t) + \lambda_3 \frac{1428}{2} R^2(t)$$

should be

$$V(S(t), I(t), R(t)) := \lambda_1 \left( \frac{\eta}{\mu} N - S(t) \right)^2 + \lambda_2 \frac{1}{2} I^2(t) + \lambda_3 \frac{1}{2} R^2(t).$$

The publisher apologizes for the errors caused. The original paper has been updated.

#### Author details

<sup>1</sup>Department of Statistics, Universidad Nacional de Colombia, Bogotá, Colombia. <sup>2</sup>CIMFAV, Universidad de Valparaíso, Valparaíso, Chile.

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#### References

1. Ríos-Gutiérrez, A., et al.: Studies on the basic reproduction number in stochastic epidemic models with random perturbations. *Adv. Differ. Equ.* **2021**, 288 (2021). <https://doi.org/10.1186/s13662-021-03445-2>