The Effect of Fitness on Global

Health Economics Research Centre, University
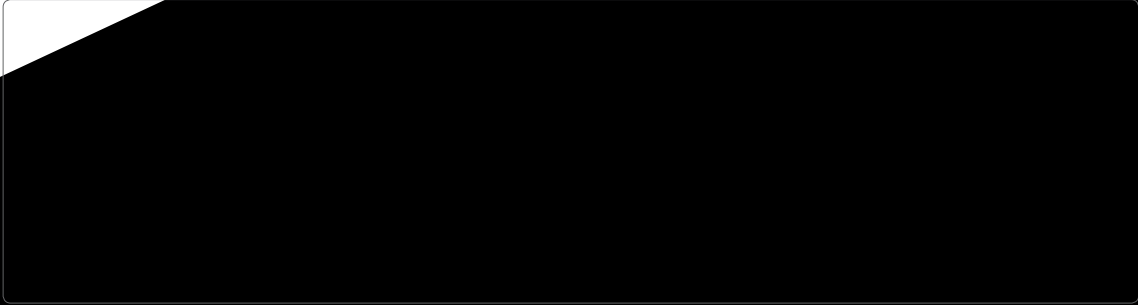
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of the PA behaviour-health process and the effects of interventions on this process for two key reasons: to lower the risk of producing bias in the cost-effectiveness results and to align the modelling approach with the goals of the decision-makers the model is intended to inform. Because society values eliminating unfair inequities combined with increasing health, public health decision-makers prioritise minimising existing health disparities in the population, such as those related to socioeconomic variables. Numerous studies have been conducted with the goal of creating taxonomies of the mathematical and epidemiological paradigms that health economic modellers might use.

This has also been taken into consideration in order to enlighten model-based economic evaluations in the field of public health. Based on their capacity to explicitly represent time-dependent effects and interactions between people and their environment, these frameworks have been broadly categorised into cohort and individual level methods. To put it briefly, cohort-level frameworks are typically simpler than individual-level ones. With decision trees and comparative risks assessments (CRAs), which have the highest modelling capacity, neither time nor interactions can be explicitly taken into account. Instead of representing time in the process implicitly as a series of state [12-15] transitions, Markov chains, which may be applied to both individuals and cohorts, can explicitly express time in the process. More complicated are discrete time events and agent-based models, which have only seen limited use in public health despite their formal capacity to depict changes in states over time and interactions between people (the latter), using either discrete or continuous time frameworks. The implementation of these methods in practise (i.e., the structural assumptions used) can have an impact on the validity of cost-effectiveness conclusions in addition to the applicability of the modelling framework. Similar to how the National Institute of Health and Care Excellence (NICE) assesses models submitted by manufacturers, previews have been made in other public health evaluation settings to question the veracity of the models' fundamental structural assumptions. No rigorous study has, to date, specifically looked into these problems in the PA literature. This gap is to be filled by the current paper.

Methods and Discussion

The search approach, eligibility requirements, study screening, and selection procedures are all given in detail in Appendix I. From the beginning of the database through April 2019, model-based economic evaluations of PA interventions were found in the published literature. Only complete economic evaluations were included due to the review's focus (i.e. cost-utility, cost-benefit, cost-consequences and cost-benefit analyses).

Main findings

This methodological study, which complements earlier reviews, offers an overview and assessment of the modelling techniques used in model-based [12-15] economic evaluations for evaluating implications of changes in PA on public health. The key structural presumptions that underlie the models have been clarified by this assessment, which can help comprehend the cost-effectiveness results and point up potential areas for model development.

Results

There were 25 different models found. The most popular models were cohort models. Across studies analysing comparable populations, there was significant variation in the modelling of downstream diseases. Most of the time, structural assumptions about the dynamics of changing physical activity were erroneous. Only a few research addressed heterogeneity, and writers at best acknowledged the issue of health equity.

Conclusions

The majority of this material is characterised by modelling techniques that do not fully meet the challenges of illustrating the relationship between physical activity behaviour and population health.

These sources of uncertainty might be diminished with the creation of a reference model and agreement on how to model the effects of physical exercise on public health.

Acknowledgement

Conflict of Interest

The authors declare that they have no competing interests.

1. Så}&|æå¦ JR (2019) I{ }[¦cæ}&^ [- æ O}^ H^æ|c@ æ]]¦[æ&@ å} æåçæ}&å}* *¦[àæ| @^æ|c@ •^&¨¦åc^ æ}å c@^ S¨•cæå}æå|^ D^ç^¦[] {^}c G[æ¦•. R^ç¨^ •&å^}cå,& ^c c^&@}å¨¨^ 38: 145-154.

2. A•|æ{ B, K@¨¦•@ïå M, A¦•@æå MI, M¨:æ{ {å| S, Ræ•[[| M, ^c æ|. (2021). A}cïàå[cïå ¦^•ï•cæ}&^: []^ @^æ|c@ []^ ¸ [¦|å [¨c|[[\. F¦[}cå^¦• å} C^||¨|æ¦ æ}å I}-^&cå[} Mïå¦[àå[|[*^ 1153.

3. D[@^¦c^ R, Mæåå*æ} S, Yæ¦¦å}*c[} G, E||å• J (2019) S|^^] æ}å }¨c¦åcå[} å}c^¦æ&cå[}•: å{ }|ïå&æcå[}• -[¦ æc@|^c^•. N¨c¦ïå^}c• 11: 822.

4. Jæ*æ}}æc@ A, Tæ^¦[¦ L, Yæ\æ- Z, Væ•¨å^çæ} SR, F[•c^¦ RG, ^c æ|. (2017) *^}^cïå&• [- &å¦&æåïæå} ¦@^c@{ •, •|^^] æ}å @^æ|c@. H¨{ M[¦| G^}^c 26: 128-138.

5. S[{à^¦* J (2009) H^æ|c@ Cæ¦^ R^-[¦{. A{ J T@^¦ 16: 281-282.

6. Yæ@}^¦-R[^å|^¦ DL, K}¨c@ P, J¨&@^{• RH (1997) T@^ G^¦{æ} @^æ|c@-&æ¦^ •¨•c^^{. Mæ^[C|å} P¦[& 72: 1061-1068.

7. Næ||¨ MC (2009) H^æ|å}* @^æ|c@ &æ¦^. J C|å} I}ç^•c 119: 1-10.

8. Y^å}•c^å} JN (2016) A} ¼å}å¨•c¦æ| ¦^ç[[¦cå[}+å} @^æ|c@ &æ¦^: c@^ åæcæ c^|| ¨• c@^ cå{^ @æ• &[{^. S]å}^ 41: 1-2.

9. Mæ¦•@æ|| E C (1989) A••¨¦æ}&^ [- ¨¨æ|åc^ çå•å[} &æ¦^¦ å} æ|c^¦}æcïç^ @^æ|c@ &æ¦^ å^|åç^¦^ •^•c^^ {•. J A{ O]c[{ A••[& 60: 827-831.

10. C¨c|^¦ (2021) B¨å|åå}* @^æ|c@ &æ¦^ à^cc^¦ {^æ}• ¦^å}å}* å} &[•c•. I} JAMA H^æ|c@ F[¦¨^ { 2: 210117-210117.

11. Lå}å^¨¨^ BG (2009) A{^¦ïå&æ} H^æ|c@ Cæ¦^ S^•c^^{ Dï•æ•c^¦. O¦c@[]^åï&• 32: 551.

12. A{}]{[{ æ@ IG, Mæ¦æ¨-Aå¨¦|å BS, Mæ¦æ¨-Aå¨¦|å AE, E{ ^c[TI (2020) E^&&ïç^}^••[- å}c^*¦æc^å @^æ|c@ •^•c^^{• å} A-¦ïå&æ: æ •^•c^^{ æcïå& ¦^çï^ ¸. M^åå&å}æ 56: 271.

13. I¦¦¸å} MR, O]] MR (2017) S|^^] @^æ|c@: ¦^åå]¦[&æ| ¦^^¨¦æcïå[} [- •|^^] æ}å å}}æc^¦ å{{ { ¨¨}ïc^. N^¨¦[]•^&@[]@æ¦{ æ&[|[*^ 42: 129-155.

14. Gæ{æ&@^ R, K@æ¦¦æ:å H, Y^å}}^¦ JP (2018) P¨å|ïå& æ}å][]¨¦æcå[} @^æ|c@ å}-[¦{ æcïå&•: c@^ à¦¦åå*¦}å* [- àå¨ åæcæ c[à^}^,c &[{{¨¨}å&å•. Ÿ^æ¦à[[\ [- {^åå&æ| å}-[¦{ æcïå&• 27: 199-206.

15. Jæ}å[[T (2020) Y HO *¨ïåæå}&^-[¦ åå¨ïcæ| @^æ|c@: ¸ @æcïc {^æ}•-[¦¦^•^æ¦&@|&@^¦•.