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# FROM EVIDENCE-BASED PRACTICE TO EVIDENCE-INFORMED PUBLIC HEALTH: A NARRATIVE REVIEW

## *Da prática baseada em evidências para a saúde coletiva informada por evidências: revisão narrativa*

## *De la práctica basada en evidencias para la salud colectiva informada por evidencias: revisión narrativa*

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**ABSTRACT**

**Objective:** To review the literature about the description of concepts and the use of scientific evidence in Public Health (PH). **Methods:** A narrative review was carried out using and combining the keywords "Public Health" OR "Collective Health"; "Evidence-based medicine" and "Evidence-informed policy" to consult the Lilacs, SciELO and MedLine databases. The searches were limited to articles published between January 1990 and December 2016 in Portuguese and/or English. The studies were selected by two independent authors who read the title, abstract and full text. For the synthesis process, the themes found were grouped into three main guiding axes: health evidence and practice, PH evidence, and the advances and challenges of Evidence-Informed Public Health (EIPH). **Results:** The findings of this review point out that decision making in PH is more complex than individual clinical decisions as it involves assessment of budgetary and political impacts, thus reinforcing the relevance of adopting evidence-informed practice in this field. **Conclusion:** The means of appropriation and use of evidence in the PH field are complex because they involve assumptions of plausibility and adequacy that are not always observed in individual interventions. Yet, the field benefits from the approach observed in EIPH and, particularly, in health decision making.

**Descriptors:** Public Health; Evidence-based Medicine; Decision Making.

***RESUMO***

***Objetivo**: Revisar na literatura a descrição dos conceitos e o emprego das evidências científicas no âmbito da Saúde Coletiva (SC). **Métodos**: Realizou-se uma revisão narrativa utilizando e combinando as palavras-chave "Saúde Pública" OR "Saúde Coletiva"; "Medicina baseada em evidências" e "Política informada por evidências" por meio da consulta as bases de dados Lilacs, SciELO e MedLine. As buscas foram limitadas ao período entre janeiro de 1990 a dezembro de 2016, no idioma português e/ou inglês. A seleção dos estudos foi realizada por dois autores, de modo independente, por meio da leitura do título, resumo e texto completo. Para o processo de síntese, as temáticas encontradas foram agrupadas em três grandes eixos norteadores: as evidências e a prática em saúde, as evidências em SC, e os avanços e desafios da Saúde Coletiva Informada pelas Evidências (SCIE). **Resultados**: Os achados desta revisão apontam que as tomadas de decisão na SC são mais complexas do que as decisões clínicas individuais, pois envolvem avaliações de impactos orçamentários e políticos, reforçando a relevância da adoção de práticas informadas pelas evidências neste campo. **Conclusão**: Os meios de apropriação e emprego das evidências no campo da SC são complexos, pois envolvem pressupostos de plausibilidade e adequação nem sempre observados em intervenções individuais. Ainda assim, o campo beneficia-se da aproximação observada na SCIE e, em particular, na tomada de decisões em saúde.*

***Descritores**: Saúde Pública; Medicina Baseada em Evidências; Tomada de Decisões.*



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***RESUMEN***

***Objetivo**: Revisar en la literatura la descripción de los conceptos y el empleo de las evidencias científicas en el ámbito de la Salud Colectiva (SC). **Métodos**: Se realizó una revisión narrativa utilizando y mesclando las palabras-clave "Salud Pública" OR "Salud Colectiva"; "Medicina basada en la evidencia" AND "Política informada por evidencias" a través de la consulta en las bases de datos LILACS, SciELO y MEDLINE. Las búsquedas se han limitado al período entre enero de 1990 y diciembre de 2016 en los idiomas portugués y/o inglés. La selección de los estudios se dio por dos autores de modo independiente a través de la lectura del título, resumen y texto completo. Para el proceso de síntesis se han unido las temáticas encontradas en tres grandes ejes norteadores: las evidencias y la práctica en salud, las evidencias en SC y los avances y desafíos de la Salud Colectiva Informada por las Evidencias (SCIE). **Resultados**: Los hallazgos de esta revisión apuntan que las tomas de decisiones de la SC son más complejas que las decisiones clínicas individuales pues implican evaluaciones de impactos políticos y de presupuesto con refuerzo para la importancia de prácticas informadas por las evidencias en este campo. **Conclusión**: Los medios de apropiación y empleo de las evidencias para el campo de la SC son complejos pues implican presupuestos de plausibilidad y adecuación no observados en intervenciones individuales. Aun así, el campo se beneficia de la aproximación observada en la SCIE y, en particular, de las tomas de decisiones en salud.*

***Descriptores**: Salud Pública; Medicina Basada en la Evidencia; Toma de Decisiones.*

## INTRODUCTION

One of the challenges for the formulation and implementation of public health policies is the promotion of the use of scientific evidence in countries such as Brazil, where they are strongly influenced by socioeconomic factors and budgetary constraints, which are even bigger challenges[1,2].

The adoption of scientific evidence (SE) in Public Health (PH) practice aims to ensure optimization of resources and greater effectiveness in health care and promotion and disease prevention actions[1]. Although the use of evidence in PH is possible and desirable, the transposition of the concept of "evidence-based" into the field is not straightforward. The complex actions involved in the social determination of diseases and in the work process in the health field, which are commonly found in PH, differ substantially from the simplification usually involved in individual health practices – for instance, individual care in a physician's office.

Research[2] has categorically reported that the use of SE by health managers is still elementary in the field, especially with regard to their use in "decision making"[2].

To discuss the main difficulties inherent in this process and to present existing initiatives that may allow a better approximation, the objective of this study was to review the literature on the description of concepts and the use of scientific evidence in the Public Health field.

## METHODS

This narrative review consisted of a search for studies using the following keywords (and their main synonyms) included in the Health Sciences Descriptors (*Descritores em Ciências da Saúde – DeCS*): "Public Health" OR "Collective Health", "Evidence-Based Medicine" and "Evidence-Informed Policy". The Lilacs, SciELO and MedLine databases (via PubMed) were searched. The searches, carried out by two authors independently, were limited to the period between January 1990 and December 2016 and to articles published in Portuguese and/or English.

The selection criteria applied included: qualitative, quantitative, review or editorial studies whose main theme was the analysis of the relationship between the use of scientific evidence and its use in and/or impact on public health policies. The titles and abstracts of 29.835 publications were reviewed (duplicates were excluded) and the full text of 34 manuscripts were read and included in this review.

The data was synthesized by two authors who grouped the most prevalent themes in the included manuscripts into three main guiding axes: health evidence and practice, PH evidence, and the advances and challenges of Evidence-Informed Public Health. The findings of this review will be discussed based on the aforementioned themes.

## RESULTS

### Health evidence and practice

The concept of "evidence" was introduced by René Descartes in the first half of the seventeenth century in the book "*Discours de la méthode*". In that book, the philosopher conveys his concern to find a method to know the truth that, when used, would allow to accept as true only what was evident[3].

Currently, the term "scientific evidence" has been used to refer to the set of information used to confirm or deny a scientific theory or hypothesis. Thus, evidence is produced when studies and research are conducted with the aim of clarifying the relationship, effect or causality between two or more variables, conditions or interventions.

The first references to the term "Evidence-Based Medicine" (EBM) were published by Guyatt and Sackett[4,5], who were, at that time, eminent clinical epidemiologists at McMaster University (Canada). Then, their group of disciples structured and promoted the dissemination of the concept, attracting protagonists, mainly in North America[6]. The EBM appeared later as a scientific movement that translates into the recommendation that the practice of medicine should take place in a context in which professional experience is integrated with the capacity to critically analyze available scientific information and to apply it in a rational manner, in partnership with the subject(s) involved, in order to improve the quality of care[7].

Without nihilistic pretensions, the EBM recommended the judicious and explicit use of the best available SE in decision-making, always focusing on individual health care[5,6,8]. Although important gaps between the evidence generated by epidemiological analyses and the health practice were acknowledged, the EBM provided important resources which allowed advances in the validation of information and in the analysis of the efficacy and effectiveness of health interventions and medical practice[9].

The EBM was gradually incorporated, adjusted and adapted to different contexts, scenarios and movements. Its construct gradually evolved into a broader concept of "Evidence-Based Practice"[10] (EBP). Evidence alone was not able to direct or modify health decisions, that is, EBP assumed that decision-makers should take into account the needs and values of the subject (as well as those of populations) and the availability of resources for its implementation[11].

Given the immeasurable increase in the amount of information and evidence potentially available for use in professional practice at the individual level and for the structuring of public policies and/or operational decisions in health, EBP has stood out as a pertinent and attractive alternative[6,11]. By providing strategies for selecting the best available evidence and recommending the effective use of this information, it was hoped to provide conditions for public managers to adopt "best practices" in decision-making[12,13].

In this context, it is fundamental to realize that "creating evidence" and "creating health actions" are absolutely distinct processes. Also, scientific research (and all forms of producing evidence) is an act of knowledge production. On the other hand, the creation of health actions (for instance, decision making), which can use (or not) the evidence produced and available, is fundamentally a political act or a result of social relations of power[14].

The appropriation and use of SE has been recommended by the World Health Organization[15] (WHO) with a view to improving the performance of health systems of its member states. Similarly, the Pan American Health Organization (PAHO) has included the use of SE in the recommended lines of action for institutional capacity building on the health agenda for the Americas[16].

However, the transfer of the concept of "evidence-based" from clinical practice to the field of PH knowledge and practice has not been so straightforward[13]. In this context, PH means "an organized effort of society, especially its public institutions, to improve, promote, protect and recover the health of the population through collective actions"[17].

Evidence seems necessary, but it is not sufficient to answer the questions and meet the needs of the collectivity[14,18]. In addition to knowing if an intervention will work (efficacy), it became important to know if it would work in the "real world" (effectiveness), the costs (efficiency), the distribution of risks and benefits, if its implementation would be acceptable and adequate (without risks), and if the system's ability to incorporate such intervention would allow it to be available to everyone (equity)[12].

While EBM and EBP are mainly focused on individual practice, PH focuses on the social health needs of the collectivity, "conceiving health care actions as technical and social practices"[19]. Particularly in complex domains such as health promotion, fundamental aspects (such as "acceptability", adherence, and the importance given by a population to a given intervention) are as important as the methodological quality of evidence, its consistency and corroboration[3,20].

**Public Health evidence**

In the PH field and practice, the "Evidence-Based Public Health" (EBPH) construct has been incorporated as one of the instruments used in the cycle of producing evidence and answers necessary for decision making[14].

The EBPH is based on the integration and conscious and critical use of the best current evidence available for decision-making in community and population care in the fields of protection, disease prevention and health promotion[13,14,21].

In fact, better decisions on health interventions essentially require a transparent and reproducible process that should consider, for example, whether an intervention is sufficiently incapable of causing measurable damage. Generally, this information comes from evidence generated by observational studies and evaluated at the experimental level (through RCTs) whenever possible so that cost-effectiveness analysis estimates are obtained[22].

Given the contextual complexity of PH practice, evidence should be considered not as a definitive response to specific problems, but as an additional element that should be incorporated into the discussion and debate that guides decision making, thus transcending the epidemiological field and interacting with the social, cultural, political and economic dimensions[14,21].

As pointed out in a study[23], as interventions in PH are subjected to "a degree of complexity higher than that in usual clinical research", it is important to note some fundamental differences between EBP and EBPH: a) the unit of analysis is usually

populational, not individual; b) complex multicomponent interventions are often more difficult to describe and characterize than simple interventions (such as the use of a particular drug in a controlled research environment); c) and randomized controlled trials are not always possible in Public Health[23].

PH decisions tend to be more complex than clinical decisions because they involve assessing the likely impact of policies and other interventions which are generally long-term[24]. Decision making in PH is not a single event, but a diffuse process, with several stages scattered over time without a clear and predictable relationship between them[25].

Although EBPH is both possible and desirable, the course required for a tested intervention under controlled conditions to be reproducible under routine conditions is much more complex[20]. Probability assumptions (based strictly on RCTs results) should be complemented by confirmations of plausibility (derived from observational studies with comparison groups) and adequacy (effects or trends on the behavior of indicators suggesting the effectiveness of the intervention)[18,20].

No research method is individually capable of providing sufficient responses for the immediate use of evidence in the field of collectivity[9,10,22,26]. Differently from the individual application of RCTs information, PH should be able to respond to the needs of extremely heterogeneous populations, including their complexity and variability, which are usually not generalizable from the results of studies focusing solely on the effectiveness of an intervention[9].

RCTs are generally not sufficient as a driving force for decision making in the assessment of PH interventions. Usually, the triangulation of different research methodologies support SE produced by epidemiological studies of high internal validity in decisions on health interventions[20,26].

Recently, the WHO has begun to recommend the incorporation of a standard system for the grading, assessment, development and evaluation of evidence (the GRADE System) in the establishment of public health recommendations and in the process of decision making in health[27]. The GRADE System guidelines, for example, include and highlight the importance of observational studies and qualitative research in the production of knowledge and evidence[28].

Some of the strategies suggested to encourage the use of evidence in decision-making include systematic reviews (SRs), which are secondary studies that use structured and rigorous methods to examine, compare and synthesize empirical evidence which are relevant to a specific research question[29-31]. They aim to find, critically evaluate and interpret all the studies available to a research question, field of knowledge or phenomenon of interest[32].

SRs reduce the risks of bias and random errors by analyzing all the available evidence through a transparent, explicit, reproducible, rigorous and comprehensive process[22,29,30]. SRs allow the identification of the nature and quality of the evidence provided by primary studies, the consistency of the studied effect and the evidence of causality, especially when the results of multiple studies are controversial or conflicting[29].

Although SRs can greatly contribute to the construction of EBPH knowledge, reducing error and improving accuracy in health decision making[10,22,26], authors argue that alternative and innovative designs should be used and tested[10,18,20]. These should include cluster randomized and non-randomized designs and qualitative research[18] and reviews of risk factors and prognoses, which include comparative observational studies in which the researcher collects data and observes and compares the events as they occur[32,33].

**Evidence-Informed Public Health: advances and obstacles**

PH proposes integrated health promotion, protection, recovery and rehabilitation actions based on a multidisciplinary approach[19] focused on populations and communities (rather than individuals) through multicomponent interventions (rather than single interventions) which should analyze not only the outcomes, but also the causal process, theories and beliefs of the communities[18]. In this context, it is unlikely that its complexity will find reflection and support in the particular means of appropriation and use of scientific evidence.

Considering that scientific evidence does not determine social health actions and needs, the use of the concept of "Evidenced-Informed Public Health" (EIPH) is more appropriate than the term EBPH. Although evidence may be only one element in the decision-making process, the systematic use of evidence derived from research results in this process is scarce and incipient, and represents a challenge for health policies, especially in developing countries[2].

In order to promote mechanisms that facilitate the regular use of research results in decision-making, respecting local needs and the rational use of available resources, the WHO and the PAHO have designed an innovative initiative called The Evidence Informed Policy Network (EVIPNet). The network has been present in 12 Latin American countries since 2012 (including Brazil), acting as a facilitator in the review of public policies, as well as conducting deliberative dialogs on the prevention and control of dengue in the urban space and on the role of primary care in the comprehensive approach to managing noncommunicable diseases[34].

Regardless of the context in which a society is inserted, the continuous development of technological innovations may represent a problem for health management, as the rapid diffusion of technical and scientific information (mainly under the influence of industry) creates strong demands for incorporation of these innovations in such a way that the costs of health systems (public and/or private) tend to rise significantly. Unfortunately, a technological innovation does not necessarily represent resource saving or a perceptible increase in the outcomes of interest to the community.

In this regard, in the 1960s the international community began to identify the need to establish valid processes to assist health decision-makers, health professionals, heads of services, patient organizations, the judicial system and health ministers. Then, the concept of health technology assessment (HTA) emerged and was defined as "a process that assesses and regulates the use of health technologies, offering technical support based on the best scientific evidence"[35].

One of the fundamental tools of the HTA is the critical assessment of the validity of the clinical studies carried out with the technology of interest (medicines, procedures, equipment and support and organizational systems). HTA is carried out through a systematic review of the literature, followed by a cost-effectiveness analysis of the potential incorporation of the technology[35].

Within the scope of Brazil's Unified Health System (*Sistema Único de Saúde – SUS*), Law No. 12.401/2011, which provides for therapeutic care and incorporation of health technologies, has assigned to the National Commission for the Incorporation of Technologies (*Comissão Nacional de Incorporação de Tecnologias – CONITEC*) the responsibility for the incorporation, exclusion or alteration of technologies in the SUS.

The creation of the Brazilian Network for Health Technology Assessment (*Rede Brasileira de Avaliação de Tecnologias em Saúde – REBRATS*), which was institutionalized by Ordinance No. 2.915, of December 12, 2011, was another important landmark in the establishment of public guidelines aimed at the generation and synthesis of scientific evidence in the field of HTA. The Rebrats consists of a network of collaborating centers and teaching and research institutions and has undertaken the work of standardization and elaboration of methodological guidelines on HTA in the country.

An adequate critical evaluation of the validity, integrity, and applicability of evidence relevant to PH interventions can be challenging, as randomization, allocation and blinding processes are not always feasible in the design. In addition, potential biases of information and contamination of control/intervention groups, together with the high risk of abandonment, may influence the assessment of the effectiveness and usually compromise the final quality of these studies[18]. Nevertheless, the EIPH is an important source of information to optimize the use of health resources and to ensure that decision-making is based on effective and corroborated practices.

## CONCLUSION

Although the concepts of "evidence-based" have changed from their earliest records, from a focus on individual health care to a broader concept of Evidence-Based Public Health, their transposition into the field of Public Health, practices has not been straightforward. In Public Health, the means of appropriation and use of evidence are much more complex than the involvement in clinical decisions, as they involve assumptions of plausibility and adequacy that are not always observed in individual interventions and evaluations of budgetary and political impacts.

Even so, the field benefits from the approach observed in Evidence-Informed Public Health and, in particular, in health decision making. Global and regional initiatives have demonstrated the importance of this approach to optimize practices and make health actions more effective.

## REFERENCES

1. Ministério da Saúde (BR). Síntese de evidências para políticas de saúde: estimulando o uso de evidências científicas na tomada de decisão. Brasilia: Ministério da Saúde; 2015.
2. Dias RISC, Barreto JOM, Vanni T, Candido AMSC, Moraes LH, Gomes MAR. Estratégias para estimular o uso de evidências científicas na tomada de decisão. Cad Saúde Colet (Rio J). 2015;23(3):316-22.
3. Juarez Garcia MS. Nivel de evidencia en salud pública. Rev Soc Peru Med Interna. 2006;19(2):55-7.
4. Evidence-Based Medicine Working Group. Evidence-based medicine: a new approach to teaching the practice of medicine. JAMA. 1992;268(17):2420-5.
5. Sackett DL, Rosenberg WM. On the need for evidence-based medicine. J Public Health Med. 1995;17(3):330-4.
6. Jenicek M. Epidemiology, evidenced-based medicine, and evidence-based public health. J Epidemiol. 1997;7(4):187-97.
7. Lopes AA. Medicina baseada em evidências: a arte de aplicar o conhecimento científico na prática clínica. Rev Assoc Méd Bras. 2000;46(3):285-8.
8. Glasziou P, Longbottom H. Evidence-based public health practice. Aust N Z J Public Health. 1999;23(4):436-40.
9. Shelton JD. Evidence-based public health: not only whether it works, but how it can be made to work practicably at scale. Glob Health Sci Pract. 2014;2(3):253-8.
10. Ammerman A, Smith TW, Calancie L. Practice-based evidence in public health: improving reach, relevance, and results. Annu Rev Public Health. 2014;35:47-63.

11. Gray JA. Evidence-based public health--what level of competence is required? J Public Health Med. 1997;19(1):65–8.

12. Mowat D. Evidence-based decision-making in public health. Ethos Gub. 2007;4:231-48.

13. Cediel-Becerra NM, Krause G. Evidence-based public health decision-making tools which can also be used for prioritising disease. Rev Salud Pública. 2013;15(5):694-706.

14. Ministério da Saúde (BR), Universidade Federal de Goiás. ASIS - Análise da situação de saúde [Internet]. Brasília: Ministério da Saúde; 2015. v. 1 [accessed on 2015 Jan 12]. Available from: http://bvsms.saude.gov.br/bvs/publicacoes/asis_analise_situacao_saude_volume_1.pdf

15. Tandon A, Murray CJ, Lauer JA, Evans DB. Measuring overall health system performance for 191 countries [Internet]. (Global Programme on Evidence Discussion Paper Series, 30) [accessed on 2016 Oct 21]. Available from: http://www.who.int/healthinfo/paper30.pdf

16. Pan American Health Organization. Health Agenda for the Americas 2008-2017 [Internet]. Panama: 2007 [accessed on 2016 Oct 21]. Available from: http://new.paho.org/hq/dmdocuments/2009/Health_Agenda_for_the_Americas_2008-2017.pdf

17. Pan American Health Organization. Public health in the Americas: conceptual renewal, performance assessment and bases for action. Washington: WHO Regional Office for the Americas; 2003.

18. Buendía-Rodríguez JA, Sánchez-Villamil JP. Using systematic reviews for evidence-based health promotion: basic methodology issues. Rev Salud Pública. 2006;8(Supl 2):94-105.

19. Souza LEPF. Saúde pública ou saúde coletiva? Espaç Saúde. 2014;15(4):7-21.

20. Victora CG, Habicht J-P, Bryce J. Evidence-based public health: moving beyond randomized trials. Am J Public Health. 2004;94(3):400-5.

21. Duarte EC. A informação, a análise e a ação em saúde. Epidemiol Serv Saúde. 2003;12(2):61-2.

22. Threlfall AG, Meah S, Fischer AJ, Cookson R, Rutter H, Kelly MP. The appraisal of public health interventions: the use of theory. J Public Health (Oxf). 2015;37(1):166-71.

23. Vidal EIO. O que esperamos das revisões sistemáticas no futuro. Cad Saúde Pública [Internet]. 2016 [accessed on 2017 July 14];32(9):eED010916. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102-311X2016000900101&lng=en

24. Mowat DL, Hockin J. Building capacity in evidence-based public health practice. Can J Public Health. 2002;93(1):19–20.

25. Lonas J. Connecting research and policy. Can J Policy Res. 2002;1:140-4.

26. Hatt LE, Chatterji M, Miles L, Comfort AB, Bellows BW, Okello FO. A false dichotomy: RCTs and their contributions to evidence-based public health. Glob Health Sci Pract. 2015;3(1):138-40.

27. World Health Organization. WHO Handbook for guideline development [Internet]. Geneva: WHO; 2012 [accessed on 2016 Aug 4]. Available from: http://apps.who.int/iris/bitstream/10665/75146/1/9789241548441_eng.pdf

28. Balshem H, Helfand M, Schünemann HJ, Oxman AD, Kunz R, Brozek J, et al. GRADE guidelines: 3. Rating the quality of evidence. J Clin Epidemiol. 2011;64(4):401-6.

29. Brannon PM, Taylor CL, Coates PM. Use and applications of systematic reviews in public health nutrition. Annu Rev Nutr. 2014;34:401-19.

30. Cook DJ, Mulrow CD, Haynes RB. Systematic reviews: synthesis of best evidence for clinical decisions. Ann Intern Med. 1997;126(5):376-80.

31. El Dib RP, Atallah AN, Andriolo RB. Mapping the Cochrane evidence for decision making in health care. J Eval Clin Pract. 2007;13(4):689-92.

32. Ministério da Saúde (BR). Diretrizes metodológicas Elaboração de revisão sistemática e metanálise de estudos observacionais comparativos sobre fatores de risco e prognóstico. Brasília: Ministério da Saúde; 2014.

33. Stroup DF, Berlin JA, Morton SC, Olkin I, Williamson GD, Rennie D, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis Of Observational Studies in Epidemiology (MOOSE) group. JAMA. 2000;283(15):2008-12.

34. Moat KA, Lavis JN. Supporting the use of research evidence in the Americas through an online "one-stop shop": the EVIPNet VHL. Cad Saude Publica. 2014;30(12):2697-701.

35. Ministério da Saúde (BR), Secretaria de Ciência, Tecnologia e Insumos Estratégicos. Departamento de Ciência e Tecnologia. Avaliação de tecnologias em saúde: institucionalização das ações no Ministério da Saúde. Rev Saúde Pública. 2006;40(4): 743-7.

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