A REVIEW OF STATISTICAL METHODS USED FOR INTERVENTION EVALUATION
(*Pendekatan Kaedah Berstatistik dalam Penilaian Intervensi – Satu Sorotan*)

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ABSTRACT

The adopted United Nations General Assembly through Resolution A/RES/74/299 "Improving global road safety" with the Decade of Action for Road Safety 2021-2030 targets to prevent at least 50% of road deaths and injuries by 2030. The global plan called for a holistic approach to road safety and continued improvements in the vehicles and road, enhancement of laws and law enforcement; and provision of timely, life-saving emergency care for the injured. Various road safety interventions and programs have been implemented worldwide with the aim to reduce fatalities and injuries. The importance of evaluating the impact of intervention through sound statistical approaches is definite. As intervention could be conducted in many ways, so can the methods. By design, randomized control trials hold the gold standard in intervention evaluation. However, there are many circumstances where it is not feasible, and researchers opted for a quasi-experimental approach especially when it involves ethical or financial constraints. This paper reviews three approaches used for intervention evaluation: the difference-in-differences method, segmented regression of interrupted time series, and interventional autoregressive integrated moving average, in the field of road safety. The aim is to review the methods used for intervention evaluation or program effectiveness. The Scopus database and available research reports from World Health Organization and related agencies were used to search for available pieces of literature for the year 2013 onwards.

Keywords: intervention evaluation; statistics; methodology

ABSTRAK

Resolusi A/RES/74/299 "Menambahbaik keselamatan jalan raya global" Perhimpunan Agung Bangsa-bangsa Bersatu menyatakan komitmen global dalam mengurangkan sekurang-kurangnya 50% kematian dan kecederaan menjelang tahun 2030, melalui Dekad Tindakan Keselamatan Jalan Raya 2021-2030. Pelan global ini menyeru kepada satu pendekatan menyeluruh dan penambahbaikan berterusan dalam aspek penambahbaikan keselamatan kenderaan dan jalan raya, undang-undang dan penguatkuasaan, dan rawatan kecemasan dalam tempoh masa yang bersesuaian dan pantas. Pelbagai intervensi dan program keselamatan jalan raya dilaksanakan diseluruh dunia bagi mengurangkan kematian dan kecederaan. Kepentingan penilaian impak intervensi melalui kaedah berstatisik tidak dinafikan lagi. Kepelbagaian intervensi yang dijalankan menuntut kepelbagaian, dan rekabentuk ujian kawalan rawak adalah rekabentuk yang terbaik. Namun begitu, rekabentuk ini tidak dapat dijalankan, terutamanya jika melibatkan etika kajian dan juga kekangan kewangan sehingga penyelidik terpaksa memilih untuk menggunakan pendekatan eksperimen-kuasi. Kertas kerja ini menyoroti tiga kaedah yang digunakan dalam penilaian keberkesanan intervensi iaitu beza dalam beza, bagi siri masa terganggu dan autoregresif integrasi purata bergerak bergangguan, dalam bidang keselamatan jalan raya. Tujuan kertas kerja ini adalah untuk mengulas kaedah-kaedah yang digunakan dalam penilaian keberkesanan intervensi keselamatan jalan raya. Sorotan ini menggunakan kaedah bibliometrik dengan mengambilkira kertas kerja yang diterbitkan dalam pangkalan data Scopus, laporan-laporan daripada Badan Kesihatan Dunia

dan juga laporan dari agensi berkaitan keselamatan jalan raya, dari tahun 2013 sehingga yang terkini.

Kata kunci: penilaian intervensi; statistik; metodologi

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