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# The Burden of Acute Pesticide Poisoning and Pesticide Regulation in Korea

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## ABSTRACT

**Background:** This study aimed to estimate the burden of acute pesticide poisoning and to determine its trend with recently implemented pesticide regulations.

**Methods:** Disability-adjusted life-years (DALYs) were calculated as the sum of years of life lost (YLLs) and years lived with disability (YLDs) due to acute pesticide poisoning using the methods of the Global Burden of Disease Study 2013. The values of YLLs, YLDs, and DALYs were stratified by sex, age groups, intentionality of poisoning, and causative agents.

**Results:** From 2006 to 2014, DALYs decreased by 69% (from 69,550 to 21,742). The decreasing tendency of DALYs was especially marked from 2011. The total burden of acute pesticide poisoning was mainly caused by YLLs and intentional pesticide poisoning. The highest DALYs due to acute pesticide poisoning occurred in those in their 40s and 50s; however, the decreased rates of DALYs were higher in those aged 10–49 years than in those aged more than 50 years. Herbicides including paraquat contributed to the largest proportion of total DALYs.

**Conclusion:** As this is the first study to quantify the burden of acute pesticide poisoning using DALYs, our results provide comprehensive evidence of the importance of using strict regulations to prevent public health hazards due to acute pesticide poisoning.

**Keywords:** Agrochemicals; Burden of Illness; Paraquat; Poisoning; Suicide

## INTRODUCTION

Acute pesticide poisoning is an important public health issue worldwide.<sup>1</sup> Approximately 350,000–440,000 annual suicides by means of deliberate pesticide poisoning have been estimated to occur worldwide,<sup>2</sup> and the numbers of victims of non-fatal pesticide poisoning are assumed to be much greater. However, pesticide poisoning can be prevented and minimized by proper interventions such as regulatory legislation, safety education, and improving patient care.<sup>3</sup>

In the Korea, previous epidemiologic studies have reported a 5.4 per 100,000 persons age-standardized pesticide poisoning death rate during 2006–2010,<sup>4</sup> an annual pesticide-related hospitalization rate of 17.8 per 100,000 persons during 2004–2006,<sup>5</sup> a 26.8 per 100,000 persons annual average rate of emergency department visits due to pesticide poisoning during 2006–2009,<sup>6</sup> and 24.7% of acute occupational pesticide poisoning among male





















