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Research paper

Effectiveness and cost-effectiveness of nationwide campaigns for awareness and case finding of hepatitis C targeted at people who inject drugs and the general population in the Netherlands

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ABSTRACT

Background: Hepatitis C virus infection (HCV) is a serious, but underdiagnosed disease that can generally be treated successfully. Therefore, a nationwide HCV awareness campaign was implemented in the Netherlands targeting people who inject drugs (PWID) in addiction care ('PWID intervention') and high-risk groups in the general population ('public intervention'). The objective of this study is to assess the effectiveness and cost-effectiveness of the interventions used in this campaign.
Methods: For the 'PWID' intervention, all addiction care centres in the Netherlands provided proactive individual HCV consultation and testing. The 'public intervention' consisted of health education through mass media and instruction of health care professionals. A Markov chain model was used to estimate incremental cost-effectiveness ratios (ICER, cost per QALY gained). We included a 'DAA treatment' scenario to estimate the effect of these treatment strategies on cost-effectiveness.
Results: The 'PWID intervention' identified 257 additional HCV-carriers. The ICER was €9056 (95% CI: €6043–€13,523) when compared to 'no intervention'. The 'public intervention' identified 38 additional HCV-carriers. The ICER was €18,421 (95% CI: €7376–€25,490,119) when compared to 'no intervention'. Probabilistic sensitivity analysis showed that the probability that the 'PWID intervention' was cost-effective was 100%. It also showed a probability of 34% that the 'public intervention' did not exceed the Dutch threshold for cost-effectiveness (€20,000). New treatment regimens are likely to improve cost-effectiveness of this strategy.
Conclusion: In a nationwide HCV awareness and case finding campaign, the intervention targeting PWID was effective and cost-effective. An intervention targeting risk groups in the general population showed only a modest effect and is therefore less likely to be cost-effective.

Introduction

Hepatitis C virus infection (HCV) is an infectious liver disease that can lead to serious long-term complications. Even though an estimated 71 million people are infected worldwide, the disease remains relatively unknown among the general public and medical professionals (Polaris Observatory HCV Collaborators, 2017). HCV infection generally does not cause clinical symptoms before its complications occur. Therefore identification of those infected is often delayed. After 20–30 years, approximately 25% of those chronically infected will develop liver cirrhosis, resulting in hepatocellular carcinoma in 5% of these cases (Lauer & Walker, 2001). As a consequence, HCV is responsible for 50–76% of all liver cancer cases and two-thirds of all liver transplants in the Western world (World Health Organization, 2011). In Europe (including Russia) 11.3–14.7 million people are infected with HCV. Prevalence rates (anti-HCV) in the population vary from approximately 0.5% in

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North-West Europe to over 7% in parts of South-East Europe (Cornberg et al., 2011). In the Netherlands the prevalence is estimated at 0.1–0.4% (16,000–64,000 persons) and up to 0.6% in highly urbanized areas (Baaten, Sonder, Dukers, Coutinho, & Van den Hoek, 2007; Slavenburg et al., 2008). So far only a minority of those infected has been diagnosed (Kok, Zuure, Weegink, Coutinho, & Prins, 2007). The estimated detection rates of HCV in the population, for which the reliability and comparability is only moderate, vary across Europe from 2.7% in Poland to 80% in Sweden (Cornberg et al., 2011). High HCV prevalence rates are generally found in several risk groups. The most important risk group are people who inject drugs (PWID) with estimated prevalence rates of 60–80%. Within the Netherlands and other countries, prevalence rates among PWID differ regionally and are associated with multiple factors, such as living environment, co-infections, current and previous lifestyle and method and frequency of drug use (Nelson et al., 2011).

Other risk groups for HCV infection in the Western world are those who received blood-products before 1991 and first generation immigrants from endemic countries. HIV-positive men who have sex with men (MSM), children of HCV infected mothers and those with occupational risks of blood contact are also considered at risk for HCV infection (Cornberg et al., 2011; Health Council of the Netherlands, 2016; Vriend et al., 2013). At the time of the HCV campaign, relatively high prevalence rates made PWID, including prior PWID in methadone treatment, likely to be the most efficient population to target in the Netherlands. Furthermore, relatively high absolute numbers of unidentified HCV were anticipated among immigrants. Also, HIV-positive MSM were an emerging risk group (Kok et al., 2007; Urbanus et al., 2009; Vriend et al., 2013).

Sustained viral response (SVR) rates for HCV treatment have improved rapidly in recent years. Previously, 50% of those infected with HCV genotype 1 and 4 and 80% of those with genotype 2 or 3 could be treated successfully (Manns et al., 2007). The recently introduced DAA treatment regiments can potentially achieve SVR in over 90% of patients (Afdhal et al., 2014; Lawitz et al., 2013; Sulkowski et al., 2014; Wyles et al., 2015). These increased treatment SVR rates have converted HCV infection into a curable disease. This indicates the importance of early detection to improve HCV treatment rates, but case finding of HCV continues to be a serious challenge for health care authorities and the need to improve case finding strategies remains (Gravitz, 2011; Willemse et al., 2015; Zuure et al., 2014).

Promising developments in HCV-treatment were recognised by the Dutch Ministry of Health as generating the need for improved case finding. Therefore, the Ministry of Health initiated a national HCV case finding campaign, which was implemented from September 2009 to February 2010. This campaign consisted of two interventions, one targeting risk groups in the general population and their medical professionals and one targeting PWID in addiction care.

To determine the optimal design of the National campaign, regional pilot-campaigns using various approaches for similar populations (PWID and risk groups in the general public) were evaluated. In these pilot campaigns, increasing the awareness of HCV among risk groups in the population and medical professionals proved pivotal to improve case finding (Helsper, van Essen, Bonten, & de Wit, 2010; Helsper et al., 2012; van der Veen, Hoogenboezem, & Breemer, 2009). Therefore, increasing HCV awareness and case finding were the central aims in the national HCV campaign.

We report the effectiveness and cost-effectiveness of the two central interventions in the nationwide HCV campaign, aimed at improving case finding and increasing awareness of HCV in the Netherlands.

Methods

Interventions

Both interventions in the HCV campaign were aimed at the target populations and their healthcare workers; addiction care professionals, primary care physicians and public health workers (community workers and infectious disease- and intercultural communication experts). The campaign was implemented between September 2009 and February 2010 and included two large-scale interventions. The 'PWID intervention' was implemented in the addiction care setting. Targeted PWID mainly included people using heroin, methadone and/or cocaine. People who smoke cocaine (crack) were also considered eligible for counselling and testing. The 'Public intervention' focussed on risk groups in the general population and on medical professionals. Targeted risk groups included: PWID, first generation immigrants from countries with a HCV-prevalence rate of over 10%, HIV positive MSM, those receiving blood products before 1992, health care workers and travellers who had their skin pierced in endemic countries (>2%) and family members of HCV positive individuals.

In both interventions, risk groups were tested using an anti-HCV-ELISA test first, followed by RNA testing if the anti-HCV test was positive. Tests were performed by nurses of which the majority were addiction care nurses.

The 'PWID intervention' was implemented by all 11 Dutch addiction care institutions. In the participating methadone clinics, which are part of these organisations, local coordinators were appointed and brochures and posters targeting risk groups were distributed. The attending PWID were proactively approached by the addiction care workers and offered HCV related consultation and testing. In addition, group meetings were organized addressing the risks and treatment possibilities for HCV. Educational materials and symposia for professionals were provided to support the intervention. Testing was provided on the spot if possible or by referral to a regional laboratory where necessary.

The 'public intervention' was implemented in the six largest cities of the Netherlands; Amsterdam, Rotterdam, The Hague, Utrecht, Eindhoven and Almere. The intervention lasted six months and included the following components:

(1) The first component was aimed at increasing awareness and stimulating those at risk to visit their GP, addiction care professional or a public health service (GGD) employee. General information about HCV, its risk groups and treatment possibilities was spread through mass media such as radio advertisements, websites and internet banners. Brochures and posters were made available throughout addiction care centres, GP practices, social services and pharmacies. Informative meetings were organized at venues were high risk groups were expected to congregate such as religious venues and cultural meetings.
(2) The second component aimed to provide follow-up information for the general public and professionals. A website, which was only available during the campaign, provided elaborate information on risk groups, treatment possibilities, diagnostics and prognosis of HCV.
(3) The third component focussed on training professionals. Addiction care professionals and public health service (GGD) employees were trained on advising their target populations. GP practice staff was systematically trained by regional GP support organisations. Training included information about HCV risk, testing and communicating the need for testing. Educational materials were developed and spread among all GP practices by the Dutch college of General Practitioners (NHG).