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Vaccine preferences and acceptance of older adults

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ABSTRACT

Background: Expanding vaccination programs for the older population might be important as older adults are becoming a larger proportion of the general population. The aim of this study is to determine the relative importance of vaccine and disease specific characteristics and acceptance for Dutch older adults, including pneumococcal disease, herpes zoster, pertussis vaccination, and influenza vaccination.
Methods: A discrete choice experiment was conducted to generate choice data that was analyzed using a mixed multinomial logit statistical model.
Results: Important factors that were associated with vaccination acceptance in older adults are high mortality risk of the infectious disease, high susceptibility of getting the infectious disease, and high vaccine effectiveness. Age, influenza vaccination in 2013 and self-perceived health score were identified as personal factors that affect vaccine preference. Potential vaccination rates of older adults were estimated at 68.1% for pneumococcal vaccination, 58.1% for herpes zoster vaccination, 53.9% for pertussis vaccination and 54.3% for influenza vaccination. For persons aged 50–65, potential vaccination rates were estimated at 58.1% for pneumococcal vaccination, 49.5% for herpes zoster vaccination, 43.9% for pertussis vaccination and 42.2% for influenza vaccination. For persons aged 65 and older, these were respectively 76.2%, 67.5%, 57.5% and 65.5%.
Discussion: Our results suggest that older adults are most likely to accept pneumococcal vaccination of the four vaccines. Information provision accompanied with the implementation of a new vaccine has to be tailored for the individual and the vaccine it concerns. Special attention is needed to ensure high uptake among persons aged 50–65 years.

1. Introduction

Routine childhood vaccination has shown to be one of the most successful strategies to reduce the burden of infectious diseases [1]. For the older adult population (aged 50 years and older), in many countries currently only influenza vaccination is common to prevent disease burden. In the Netherlands, influenza vaccination is offered to all persons aged 60 years and older. Nevertheless, other vaccinations such as pneumococcal, herpes zoster and pertussis vaccinations are available and licensed [2]. Expanding vaccination programs for the older population might be important as older adults are becoming a larger proportion of the general population. Where transmission of infectious diseases in care facilities for the aged are already high, community dwelling older adults will be more socially engaged, which increases the transmission chance of infectious diseases towards this population [3,4]. As a result, prevalences of infectious diseases could rise increasing healthcare demands. Vaccination may yield both individual health benefits (not becoming sick) as well as societal benefits (i.e., lower healthcare demands and costs) as demonstrated by childhood vaccinations [1]. One of the most important factors for any vaccination program to be successful, is the acceptance of such a measure. Various factors such as vaccine and disease specific characteristics and personal factors have been identified that play an important role in the individual decision making process to accept vaccination of persons aged 50 years and older [5,6]. Yet, the relative importance of these identified factors is largely unknown. Obbtaining such information is important to optimize the implementation of vaccines and education programs for health professionals.

Therefore, the aim of this study is to reveal the relative importance of vaccine- and- disease specific characteristics that play a

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role in the individual decision-making process and final acceptance of four (candidate) vaccines (pneumococcal disease, herpes zoster, pertussis vaccination, and influenza vaccination) among Dutch persons aged 50 years and older. For that purpose, we performed a discrete choice analysis to identify vaccine preferences in this population

2. Methods

2.1. Discrete choice experiment

The term discrete choice experiment (DCE) refers to an experiment that is constructed to collect stated preference data (choices made by individuals under experimental conditions) from survey responses to hypothetical, but realistic scenario's [7]. Using this method in the field of healthcare assumes that healthcare interventions, services, or policies can be described by their characteristics (or attributes). DCE scenarios are characterized by specific attributes (characteristics) of which each attribute is varied by a specified range of categories, called levels. Scenarios are constructed from a combination of these levels. One choice task is comprised of at least two different scenarios. It is assumed that within one choice task, individuals choose the scenario they prefer most. Each respondent receives multiple choice tasks [8]. The data from the DCE is used to estimate the relative importance of the attributes and their associated levels by applying linked statistical modelling [9].

2.2. Selection of attributes and levels

Based on a literature review [5] and a focus group study [10], the following attributes were included in the DCE: clinical symptoms, susceptibility, mortality rate, vaccine effectiveness, side-effects and number of vaccinations. Levels were formulated based on information derived from the focus groups and the specific available clinical disease and vaccine information of pneumococcal, herpes zoster, influenza and pertussis. This resulted in realistic scenarios suitable for the study population.

Table 1 shows the assigned levels to the six attributes in the choice experiment.

Unlabelled scenarios (not explicitly mentioning the type of vaccine or disease on top of each of the two scenarios) were chosen to reduce possible insensitive responses (no trading between attributes) as people may focus disproportionally much on the labels [15].

An opt-out option (indicating no vaccination) was added as vaccination is not obligated in the Netherlands in real life. The attributes in which risks were included were dichotomised as much as possible. In addition, risks were presented in both text (as a risk label) and pie charts to make the interpretation as easy as possible [16,17] (Fig. 1).

2.3. DCE design

The choice tasks were generated by running a D-efficient design (Ngene Software version 1.1.1, http://www.choice-metrics.com). Such a design takes into account prior knowledge concerning the respondent's preferences and limits the generation of dominant scenarios (an obvious preferred scenario). Therefore, small (0.01) positive and negative priors were included in building the design to account for prior knowledge, these were the same for all level across all attributes.

Based on this procedure, the final design consisted of 36 choice tasks which were divided over six blocks of 6 choice tasks (by NGene). The attribute levels varied across all choice tasks. The number of choice tasks was set on six to reduce the cognitive burden on the respondents. Each choice task was introduced with the question: 'Imagine that these two vaccines were offered to you for vaccination; which vaccine do you prefer?'. The initial survey was pilot tested to ensure correct wording and to test whether respondents understood the provided information as well as the choice tasks of the DCE. Think out loud testing (a respondent completes the survey, reading it out loud, in the presence of the researcher) with eight persons ranging in age from 52 to 82 was used as part of the pilot test.

Table 1
The attributes and associated levels for the 4 diseases included in the discrete choice experiment.

Attribute	Levels	Associated disease[a]
Clinical symptoms	The vaccine protects against pertussis characterized by 1 to 3 months of coughing, episodes with tightness of the chest and sleep deprivation [1]	Pertussis
	The vaccine protects against shingles, characterized by 2 weeks of itching and painful skin rash that could develop into chronic pain [2]	Herpes Zoster
	The vaccine protects against pneumonia, characterized by 2 weeks of coughing, tightness of the chest and fever [3]	Pneumococcal disease
	The vaccine protects against the flu, characterized by up to 1 week of high fever, muscle ache and shivers [4]	Influenza
Susceptibility	1 out of 100 persons get the disease [1]	Pertussis
	Half of the people get the disease [2]	Pneumococcal disease, influenza
	Everyone gets the disease [3]	Herpes Zoster
Mortality	1 out of 100 persons with this disease dies [1]	Pertussis, herpes zoster, influenza
	20 out of 100 persons with this disease die [2]	Pneumococcal disease
Vaccine effectiveness	Half of the people are protected by the vaccine [1]	Pneumococcal disease, herpes zoster, influenza
	Everyone is protected by the vaccine [2]	Pertussis
Side effects	The injection site is painful and swollen for 1 day [1]	Pneumococcal disease, herpes zoster, pertussis, influenza
	Not feeling well for a few days which requires to stay home [2]	
Number of given vaccinations	The vaccine has to be given once [1]	Pneumococcal disease, herpes zoster, pertussis, influenza
	The vaccine has to be given twice [2]	

[a] Information on herpes zoster was obtained from [2,11], information on pneumococcal disease was obtained from [2,12], information on pertussis was obtained from [2,11] and information on influenza was obtained from [13,14].

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