International Journal of Drug Policy 26 (2015) 364–370

Contents lists available at ScienceDirect

International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo

Research paper

Remote age verification to prevent underage alcohol sales. First results from Dutch liquor stores and the economic viability of national adoption

Joris J. van Hoof[a,*], Ben C.J. van Velthoven[b]

[a] Faculty of Behavioral Sciences, University of Twente, Enschede, The Netherlands
[b] Faculty of Law, Leiden University, The Netherlands

ARTICLE INFO

Article history:
Received 18 April 2014
Received in revised form 8 August 2014
Accepted 22 August 2014

Keywords:
Alcohol sales
Underage buying
Age restrictions
Remote age verification
Cost–benefit analysis

ABSTRACT

Objectives: Alcohol consumption among minors is a popular topic in the public health debate, also in the Netherlands. Compliance with the legal age limits for selling alcohol proves to be rather low. Some Dutch liquor stores (outlets with an exclusive license to sell off-premise drinks with 15% alcohol or more) have recently adopted a remote age verification system. This paper discusses the first results of the use of the system.
Methods: We use data from 67 liquor stores that adopted Ageviewers, a remote age verification system, in 2011. A remote validator judges the customer's age using camera footage and asks for an ID if there is any doubt. The system then sends a signal to the cash register, which approves or rejects the alcohol purchase.
Results: From the 367346 purchase attempts in the database, 8374 were rejected or aborted for age-related reasons. This figure amounts to an average ratio of 1.12 underage alcohol purchase attempts per sales day in each participating liquor store. Scaling up to a national level, the figures suggest at least 1 million underage alcohol purchase attempts per year in Dutch liquor stores.
Discussion: Underage alcohol purchases can be prevented by the nationwide adoption of remote age verification. However, given the lax enforcement of the age limits by the government, adopting such a system on a voluntary basis is generally not in the economic interest of the liquor stores. Obligatory installation of the system in off-premise alcohol outlets may pass a social cost–benefit test if certain conditions are fulfilled.

Introduction

As in many other countries, in the Netherlands, one of the health policies concerns legal age limits for alcohol sales. According to Article 20 of the Dutch Licensing and Catering Act, at the time of the study described in this article, it is not permissible to sell beverages with an alcohol content of 15% or more (liquor) to people under the age of 18. Light alcoholic beverages, however, containing up to 15% alcohol (beer, wine) may currently be sold to people aged 16 years and older (as from 2014 there is one age limit for all alcoholic beverages: 18 years). Selling liquor for off-premise use has been limited to so-called liquor stores. Light alcoholic beverages for off-premise use are sold in supermarkets (by far the largest share), in liquor stores (where it is only a small part of turnover), and in various kinds of food shops, coffee and sandwich bars, take-away restaurants, and tobacco and convenience stores.

To comply with the legal age limits, the Licensing and Catering Act instructs the seller to validate the customer's age unless the customer is unmistakably older than 18. In the age validation process, the seller must verify the customer's age from a valid identification document (that is, a passport, a national identification card, or a driver's license). We note that all Dutch inhabitants aged 14 and older are under the legal obligation to carry a valid ID outside the home.

Despite the fact that the rules on alcohol sales are unambiguous and well known in the Netherlands, ample evidence shows that they are not effective. In analyses of sales personnel's behavior, mystery shopping has proved that compliance with the legal age limits on alcohol sales at off-premise retail sites (supermarkets and liquor stores) is low. The average compliance rates in these

* Corresponding author. Tel.: +31 53 489 6131.
E-mail address: j.j.vanhoof@utwente.nl (J.J. van Hoof).

http://dx.doi.org/10.1016/j.drugpo.2014.08.013
0955-3959/

types of outlets were found to range between 11% and 50% (Gosselt, Van Hoof, De Jong, & Prinsen, 2007; Gosselt, Van Hoof, Baas, & De Jong, 2011; Van Hoof & Krokké, 2011; Van Hoof, Gosselt, Baas, & De Jong, 2012). As a consequence, minors can easily obtain alcohol. In a recent study, a group of underage mystery shoppers were all able to buy alcohol. On average, buying alcohol took them less than 10 minutes (including travel and shopping time), only 2 minutes more than for buying soft drinks (Van Hoof & Gosselt, 2013).

It therefore comes at no surprise that a national survey of the drinking habits of minors between ages 12 and 17 shows that 43.2% drink alcohol at least once a month. The average consumption is 3.8 glasses of alcohol per week, with substantial variation within and between age groups. Approximately 40% of boys aged 16 and 17 drink more than 10 glasses of alcohol per week, mostly in the weekends (Verdurmen et al., 2012). Underage alcohol consumption is clearly a prevalent issue in today's society, as, for instance, studies indicate causal relations between underage drinking and youth offending (Healey, Rahman, Faizal, & Kinderman, 2014), and an increasing number of adolescents treated in hospitals for alcohol-related injuries (intoxication, traffic and other accidents, violence, aggression, and/or suicide attempts) (Van der Lely, Van Dalen, Rodrigues Pereira, & Van Hoof, 2012; Van Hoof, Van der Lely, Rodrigues Pereira, & Van Dalen, 2010; Van Hoof, Van der Lely, Bouthoorn, Rodrigues Pereira, & Van Dalen, 2011).

Admittedly, a considerable portion of underage alcohol consumption comes from the home or from friends. But that leaves a substantial 30–40% of alcoholic drinks that are bought by the minors themselves (Van der Lely et al., 2012; Verdurmen et al., 2012). Apparently, present law enforcement strategies and alcohol prevention programs are insufficient to cope with that problem. This raises the question of alternatives.

A new instrument to prevent minors from buying alcohol in commercial outlets may be the introduction of a remote age verification system that only opens the cash register if the customer's age has been validated and the alcohol purchase is approved. To gain better insight into the working of this type of instrument, we were allowed access to data from Dutch liquor stores that utilized Ageviewers, a specific remote age verification system, on a voluntary basis in 2011. These data allow us, for the first time, to obtain a direct estimate of the number of underage alcohol purchase attempts, where previous research had to rely on interviews of minors or on rather incidental mystery shopping. As remote age verification can be very effective in blocking underage alcohol purchase attempts, the logical next question is whether nationwide adoption might pass a social cost–benefit test. This paper presents some preliminary calculations showing that the outlooks are promising.

Method

Ageviewers

Ageviewers is a system designed for remote age validation. The system is connected to the cash registers of the participating stores. The cash registers automatically block a purchase, whenever a product is scanned that is subject to a legal age limit. In that case, the customer is required to touch the screen of a special terminal next to the cash register, thereby approving the remote age validation process and at the same time enabling a projection of the customer's face (captured by the terminal) to be transferred to a remote age validation center. In this center, a trained professional, not knowing what is being scanned or where, validates the customer's age on the basis of the transmitted camera footage following a set of guidelines.

As soon as the camera footage appears on the validator's screen, he or she has four main response options: (i) the purchase is approved immediately because the customer is clearly an adult, that is: unmistakably not a teenager; (ii) the purchase is not approved because the customer is clearly a child or is wearing a disguise, making it impossible to validate age; (iii) the validator asks for an identification document because the customer is not clearly an adult or a child; or (iv) the captured camera footage is insufficient to validate the customer's age, in which case the customer is asked to change his position in front of the camera. If the last option occurs, the same four response options are opened again.

All customers who are asked to show an ID (a message is shown on the terminal, or spoken instructions can be heard) are required to place their identification document on the terminal, whereupon camera footage of this ID is captured and sent to the remote validation center. Based on both the image of the customer and his/her ID, the validator (who may be a different person from the one involved in the first stage of the process) establishes the exact age of the customer and touches a button on his/her screen corresponding with the relevant age category. In the Dutch situation, the options are: (a) 18 years and older, (b) 16 or 17 years old, or (c) under 16. If the customer shows an invalid or expired ID, someone else's ID or no ID at all, the purchase is not approved.

The outcome of the age validation process (approval 18+, approval 16+, or rejection) is then transmitted to the store's cash register. Depending on the specific age limit for the product the customer wants to buy, the cash register automatically unblocks and registers the purchase, or it rejects registration of the article. Hence, the purchase of age restricted products cannot be completed (registered, paid) without authorization from the remote validation center.

The Ageviewers system hereby significantly differs from traditional methods of in-store age validation. It operates without any involvement of store personnel, which prevents the outcome to be (un)intentionally influenced by cashiers (selective attention, ignorance, misinterpretation of the law, negligence, financial considerations, fear of interaction or familiarity with customers, and so forth). Notice also that the only input of the system is the camera footage of the customer and, when asked for, his/her ID. The remote validator has no information on the specific store and the product (type, quantity) involved. This type of information can therefore not influence the age validation process.

Dataset

Our dataset consists of all age verification procedures by the Ageviewers system throughout 2011. These transactions all involve the purchase of alcohol. The dataset is highly interesting because it can help to obtain direct insight into the number of underage alcohol purchase attempts, where previous research had to rely on interviews of minors or on rather incidental mystery shopping. The dataset can also produce insight into how the customers react to the implementation of the age verification system. For that purpose, we must be able to follow the pattern of alcohol purchases in the participating stores from the moment of the system's installation. Ageviewers was first introduced in 2008. Since then, it was further developed so as to automatically log every action and decision of the remote validators. Seven liquor stores adopted the system prior to the start of the automated data logging, 67 additional liquor stores implemented it in 2011. Only for the latter stores do we have full data on the pattern of alcohol purchases since the installation of Ageviewers. So, we omitted the seven early adopters from our dataset and concentrate on the 367,346 alcohol age verification procedures performed in the 67 new adopters during 2011.

The stores in our dataset voluntarily adopted Ageviewers. These stores are privately owned and independent liquor stores, not