



Evaluation of the Lancashire Polycarbonate Glass Pilot Project

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Constabulary**
police and communities together

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Contents

Acknowledgements	1
Executive summary.....	3
1. Introduction.....	8
1.1 Background	8
2. The Lancashire polycarbonate glass pilot project.....	10
3. Evaluation methods.....	11
3.1 Customer survey.....	11
3.2 Bar staff survey.....	11
3.3 Venue observations.....	11
3.4 Polycarbonate glassware venue licensee/manager interviews	11
3.5 Venue data collection	12
3.6 Emergency services data collection.....	12
3.7 Data analyses	12
3.8 Ethics	12
3.9 Research training.....	12
3.10 Limitations.....	12
4. Pre-trial findings.....	14
4.1 Bar staff survey.....	14
4.2 Customer survey.....	16
4.3 Police and accident and emergency department data.....	20
5. Impact of using polycarbonate glassware on a range of health, criminal justice and venue trading outcomes.....	20
5.1 Customer and staff injuries	20
5.2 Customer perceptions of safety and levels of violence	21
5.3 Levels of violence	23
5.4 Venue sales.....	23
5.5 Venue environment.....	24
5.6 Drinking experience.....	24
5.7 Acceptability of using polycarbonate glassware in venues	25
5.8 Licensee/manager thoughts on future use of polycarbonate glassware	26
6. Discussion	28
7. Conclusion	30
8. References	31

Executive summary

Introduction

Glassware used in pubs, bars and nightclubs can be a major cause of injury to customers and staff. Glasses and bottles are used in 4% of all violent incidents in England and Wales (Kershaw et al, 2008) and are the most common weapons used in violence occurring in drinking environments (Coomaraswamy and Shepherd, 2003). Such violence can result in serious and sometimes fatal injury, placing major burdens on individuals and public services, including health and criminal justice agencies. Accidental breakage of glassware is also a significant cause of unintentional injury in licensed premises. One study found that, in just six months, 26% of bar workers were injured by broken glasses (Warburton and Shepherd, 2000). A third of unintentional injuries suffered by customers in a major UK nightclub were caused by broken glass (Luke et al, 2002).

To prevent glass-related violence, police and licensing authorities in many areas have encouraged or mandated the use of safer drinking vessels, including polycarbonate glassware (PCG; see Box 1) in licensed premises. Such moves have often been met with resistance by both the alcohol industry and drinkers, through concerns around negative impacts on trade and drinking experience (Winder and Wesson, 2006). However, the quality of PCG has improved in recent years and little information is available on the impacts of introducing high quality PCG in licensed premises. To address this, a project was undertaken in Lancashire by police, health services and academics to provide high quality PCG to licensed premises and assess its impacts on injury, perceptions of safety and violence, and its acceptability to customers and the licensed trade.

Box 1: Polycarbonate glassware*

Polycarbonate glassware (PCG) is made from extremely strong plastic that is virtually unbreakable. It looks like the same as standard glassware used in pubs, bars and nightclubs (e.g. pint, half pint and mixer glasses). PCG are shatterproof and hard wearing, reducing replacement costs and making them safer than standard glass, which can shatter into splinters and shards and cause significant injury. Manufacturers also claim that PCG are more environmentally friendly, using one-ninth of the energy in production compared with standard glasses. Further, PCG is often made from recycled materials and is 100% recyclable (Brewing Food and Beverage Industry Suppliers Association, 2008).

Methods

In three towns in Lancashire, between three and five licensed venues (PCG venues) were recruited to replace standard glassware with PCG for a three month period. For each PCG venue, a similar venue from the area was recruited to act as a comparison site (non-PCG venue). Lancashire Police provided each PCG venue with enough PCG to replace their entire glassware stock, and provisions were made to provide additional PCG during the trial if required. A range of measures were used to assess the impact of using PCG, including:

- Customer surveys conducted in each participating venue before (n=178) and after (n=236) the trial.
- Observational research in each participating venue.
- Venue-collected data including: number of glass injuries amongst staff and customers; number of broken bottles and glasses; incidents (e.g. fights); and weekly sales figures.
- Interviews with licensees/managers from all PCG venues.

* Some concerns have been raised around negative health impacts of PCG due to the potential release of the chemical Bisphenol A during contact with hot water. However, concerns are largely limited to the use of PCG in baby bottles (Government of Canada, 2008), with negative impacts found in early years of life. Reproductive effects in adults are considered to be negligible (Department of Health and Human Services, 2007).

- Collection of police and accident and emergency department (AED) data.

Box 2 highlights a range of limitations that should be taken into consideration when reading the study findings.

Box 2: Study limitations

Evaluating interventions in licensed premises is rarely a simple task, with factors such as the fluidity of nightlife industries and intense work pressures on nightlife staff during peak times compromising compliance. The number of venues participating in this study was limited initially by the resources available for the research. Of 22 venues originally recruited to the study, two closed during the trial period and two changed management, with new managers choosing not to participate. Four further venues did not collect data continuously during the study. Two venues adopting PCG did not use these consistently, and most PCG venues continued to serve bottles. No bar staff responded to the post-trial survey, despite repeated attempts to encourage participation. With just a small number of venues participating in the study in each town, comparison conditions were not ideal; for example, over the study period customers surveyed are likely to have visited both PCG and non-PCG venues, and injury incidents occurring in the venues were low, making identification of impacts on injury difficult. Further, police and health data were not able to be linked to individual study premises. Despite these limitations, the study provides important information on the introduction of PCG in licensed premises and useful lessons for other studies exploring the impact of similar interventions.

Key findings

Customer and staff injuries

- In venues consistently using PCG throughout the trial, glass breakages decreased from an average of 17 per venue per week before the introduction of PCG to none during the trial. No reductions in glass breakages were seen in non-PCG venues.
- Numbers of staff and customer glass-related injuries recorded by venues were low. Although changes were not significant, in PCG venues both decreased following the introduction of PCG. Staff injuries also decreased in non-PCG venues yet customer injuries increased.
- The proportion of customers in PCG venues reporting having cut themselves on broken glass over the last three months decreased from 11% pre-trial to 6% post-trial. In non-PCG venues this increased from 11% to 13%. Changes were not statistically significant.
- At interviews, all licensees and managers in PCG venues stated that in their view PCG were much safer than standard glassware.
- AED data for Chorley and Preston showed no significant changes in the number of attendances for glass-related injuries before and during the study period; however given the small number of premises involved in the trial significant changes were not expected.

“It’s been a great success. Huge amount of health and safety benefits. Less staff obviously cutting themselves, and less customers with little cuts on their toes”

Club / Bar Licensee

Safety and violence

- The introduction of PCG had no significant effects on customers’ overall perceptions of safety and violence in the venues or the study towns. However, it did appear to have some negative effects on customers’ perceptions specifically of glass-related violence.
- The proportion of customers in PCG venues believing glass-related assaults were a problem in

“This trial has been a very positive one for us. Even the glass collectors say it’s fantastic and they feel much safer going into a crowd when the nightclub’s packed. The positive thing for us is there’s not the litter at the end of the day as there is with clearing up broken glass. There’s not the injuries either.”

Club Manager

study towns increased from 24% pre-trial to 43% post-trial. Proportions decreased in non-PCG venues, but not significantly.

- Importantly, there were no changes in the proportion of customers believing glass-related assaults were a problem in PCG venues themselves, or in non-PCG venues. There were some reductions in the proportion of customers in non-PCG venues thinking glasses and bottles on the floor, and bottle-related assaults, were a problem in the venue, and these reductions were not seen in PCG venues.
- There were no significant changes in either PCG or non-PCG venues in the proportion of customers who had themselves been: involved in fights, threatened with a glass or bottle, or assaulted with a glass or bottle, over the last three months.
- Police data showed no significant changes in the number of glass-related incidents occurring in study towns during the trial period compared with the same period in the previous year. However, given the low numbers of violent incidents recorded by participating venues pre- and post-trial, changes in police data were not expected.
- Several managers and licensees of PCG venues stressed that the introduction of PCG had increased feelings of safety among their staff.

Venue sales

- Interviews with licensees and managers of PCG venues suggested that the introduction of PCG had had no negative effects on business, with no change in sales and no shift in customer purchases (e.g. from pints to bottles).
- Analyses of weekly sales figures showed no significant differences between pre-trial sales and sales during the trial in either PCG or non-PCG venues.
- Licensees and managers highlighted the cost-effectiveness of PCG, as they were unbreakable, reusable and could eventually be recycled.
- The proportion of customers in PCG venues reporting that they would be more likely to visit a bar if it used PCG increased significantly from 11% to 27%. This increase was not seen in non-PCG venues.

“We’ve had no bad reaction whatsoever to polycarbonate. They’re just as good, if not better than glass. They’re quite a robust vessel and they’ve stood up really well. Initially I did think people would shy away from them, but it’s not affected business at all and it’s been a very positive move for us.”

Club / Bar Licensee

Drinking experience

- The majority of customers surveyed did not think that using PCG changed their drinking experience.
- Some customers did report negative effects, including PCG altering the taste of the drink and making it warm quicker. Others reported that drinking from PCG made them feel as though they were being treated like a child.
- Overall, licensees and managers in PCG venues did not think PCG had negative effects on drinking experience.
- The only problem highlighted by licensees and managers was the light weight of PCG, which meant they could be knocked over easily.

“I think it actually makes the drink cooler and actually keeps the head on it.”

Bar Manager

“The only problem is the weight... of them. If they could put a weight in the bottom it would be better.”

Bar Manager

Acceptability of polycarbonate glassware

- Managers and licensees were initially sceptical about introducing PCG, fearing negative customer reactions and consequently negative effects on trade. Upon receiving PCG, however, they were impressed with their quality and happy to introduce them.

“I think they’re very very good. A lot of people have not noticed it’s polycarbonate until they’re halfway down the glass.”

Pub Manager

- Several licensees/managers stated that the quality of the PCG was so good that customers sometimes did not notice the change in glassware.
- The majority of PCG venue customers surveyed both pre- (60%) and post-trial (68%) thought pubs, bars and nightclubs in general should change to using PCG. However among non-PCG venues customers' proportions decreased from 62% pre-trial to 46% post-trial.
- Across all customers surveyed, there were no significant differences in the proportions thinking pubs, bars and nightclubs should change to PCG by age group. However, older participants (age 40-70) were more likely than younger participants to prefer drinking from standard glassware.
- All licensees and managers introducing PCG as part of the trial stated that they would continue to use it for the foreseeable future, due to the reduced costs and increased safety they bring to their businesses.

"In a nutshell we will certainly be carrying on, the benefits far outweigh the small disadvantage of [a few] customers [not liking them]. Glad we did it."

Club Manager

Conclusion

In the year prior to this study, Lancashire police recorded 500 incidents of glass/bottle-related violent crime. Thus, the Lancashire PCG trial was instigated by police in partnership with health services and academics in order to test the feasibility and impacts of introducing PCG in licensed premises. Despite the limitations of the study, the overall findings are positive. PCG appeared to be broadly acceptable to customers and had no significant impacts on their perceptions of safety and violence in venues adopting PCG. Whilst some negative effects were seen on perceptions of violence in the wider nightlife area, such impacts could be reduced through a public awareness campaign that stressed the safety benefits of PCG to both customers and staff. Despite very low numbers of glass-related injuries recorded over the study period, in PCG venues the average weekly number reduced following the introduction of PCG for both customers and staff; reductions were also seen in glass-related injuries in non-PCG venues for staff, but not customers.

Whilst data limitations and the relatively small area covered by the study hamper the ability to identify significant impacts of PCG on injuries, a critical finding was the acceptability of PCG to managers and licensees in participating venues. Despite initial scepticism, all those who introduced PCG as part of the trial stated that they would continue to use it after the trial ended given its cost-effectiveness and safety benefits. For example, staff in venues that consistently used PCG recorded an average of 17 glass breakages per week prior to the introduction of PCG and this reduced to zero during the trial. In 1998, the annual cost of replacing standard bar glassware in the UK was estimated to be £100m (Shepherd, 1998), and although PCG can be more expensive than standard glassware initially, the reduced replacement costs can soon override this. Importantly, the quality of the PCG provided through the trial was far better than managers and licensees in participating venues expected it to be, and some reported that their customers barely noticed the change to PCG. Misperceptions of the quality of PCG are likely to be hampering its wider use in nightlife. Interviewees noted that the only major difference between PCG and standard glassware was the light weight of PCG; exploring whether this could be addressed at the manufacturing stage would be useful.

The introduction of PCG is not intended to reduce violence per se, rather to prevent serious injury through its use as a weapon in violence. This study has demonstrated that the introduction of high quality PCG is a feasible measure to address serious glass-related injury and one that, despite initial scepticism, was highly acceptable to managers and licensees in participating premises. However, discouraging individuals from becoming violent must remain a key priority. Consequently, moves to introduce PCG should be included as part of

a broader strategy that also seeks to address the root causes of violence and create nightlife environments that discourage aggressive behaviour in any form.

I. Introduction

Violence occurring in and around bars and nightclubs is a key concern at both national and local levels. Tackling and treating such violence demands huge police and health service resources, while public perceptions of high levels of violence hamper efforts for regeneration and prevent large portions of society from using town and city centres after dark. For victims, the injuries sustained in assault can be devastating, particularly when glasses and bottles are used as weapons. In England and Wales, 4% of violent incidents involve a glass or bottle used as a weapon (Kershaw et al, 2008). To prevent such serious injury, police and licensing authorities in several areas are encouraging the use of polycarbonate glassware (PCG; see Box 1) in bars and nightclubs, or using licensing conditions to require the use of such glassware in venues associated with violence (City of Glasgow Licensing Board, 2006). However, little information is currently available on the impacts of a switch to PCG on levels of injury, perceptions of safety and customer use of bars and nightclubs.

In Lancashire, a joint project has been undertaken by police, health services and the Centre for Public Health at Liverpool John Moores University to provide PCG to pubs, bars and nightclubs and assess its use in preventing serious injury from violence. Data were collected from customers and staff in participating venues (both PCG venues and non-PCG venues) and local police and health services before the study and three months after its implementation. This report discusses the findings from the study, exploring the impact of using PCG in pubs, bars and nightclubs on:

- Perceptions of safety and experience of violence amongst nightlife patrons and bar staff;
- Extent and severity of injuries sustained from glassware;
- Premise trading; and,
- Environmental and venue factors (e.g. glass littering).

1.1 Background

In England and Wales, the British Crime Survey shows that a fifth of violence takes place in or around nightlife venues (Nicholas et al, 2007), with the perpetrator perceived to be under the influence of alcohol in 80% of incidents (Budd, 2003). Whilst not all violence results in injury, the use of weapons will inevitably increase potential risk. One in twenty-five (4%) of all violent incidents in England and Wales involve the use of a glass or bottle as a weapon (Kershaw et al, 2008). Furthermore, research shows that glass is the most frequently used weapon in licensed premises (excluding bodily force) (Coomaraswamy and Shepherd, 2003). Across the UK, 8% of facial injuries sustained in assaults in 1997 were inflicted by glasses or bottles (Hutchinson et al, 1998). Fatal wounds can be caused by either a whole glass thrown at a victim (Sterzik et al, 2008) or shards being used as a weapon (Rothschild et al, 2001). Whilst glass can cause injury through its use as a weapon, broken glass, particularly in crowded nightlife venues, also poses a risk for unintentional injury. In one study at a nightclub in Liverpool, over a three year period, 31% of cases of unintentional injury amongst patrons were caused by broken glass (Luke et al, 2002). Bar staff also often sustain cuts from glass; one study found that 74% of bar staff reported lacerations from broken glassware at work, of which 18% were injured on more than ten occasions (McLean et al, 1997). Another study found that over a six-month period, 26% of bar workers were injured on one or more occasion with pint glasses (Warburton and Shepherd, 2000).

The impacts of glass-related injury are far ranging. Glass-related injuries can lead to serious wounding, requiring hospital treatment and causing scarring and subsequent anxiety and

psychological impacts (Tebble et al, 2004). Research suggests that glass-related injuries are more serious (and costly to the taxpayer) than injuries sustained by bottles (Coomaraswamy and Shepherd, 2003). It is estimated that an alcohol-related glassing incident can cost up to £180,000 to treat, involving up to 48 different professionals (McManus, 2003). Over a one-year period, the cost to the taxpayer of compensation as a result of glass and bottle-related assault in the UK has been estimated at £1.15 million (Coomaraswamy and Shepherd, 2003).

There is increasing recognition of the serious impact that glass-related injury has on victims, nighttime economies and society in general. Removal of glassware from licensed premises has been proposed as an important step in enhancing community safety by reducing the severity of injury from glassware (Luke, 2002). In 2002, the Safer Clubbing guide provided a range of measures to improve safety in nightlife, including providing drinks in plastic or toughened glasses¹ (Webster et al, 2002). A randomised controlled trial assessing the effectiveness of toughened glass compared to annealed glass in the barroom setting found that the injury rate amongst staff in bars using toughened glass was 60% higher than that in bars using annealed glass. Upon further investigation, the toughened glasses used in the trial (which were widely available to the alcohol trade) were found to be less impact resistant than the annealed glass. The researchers assessed an alternative type of toughened glass from another manufacturer and found these to be more impact resistance than the two types of glassware used in the trial and, consequently, highlighted that national standards for toughened glass were required to ensure they are more impact resistant than standard glass (Warburton and Shepherd, 2000).

PCG provide another alternative that, due to them being virtually unbreakable, may reduce serious injury from glassing incidents. As part of a wider programme in Glasgow to reduce violence in its nighttime economy, a glassware ban policy was introduced in 2006, meaning venues open past midnight had to use PCG. Whilst there were some exceptions to the ban,

Box 1: Polycarbonate glassware (PCG)

PCG is made from extremely strong plastic that is virtually unbreakable. It is manufactured to look exactly like standard glassware used in bars, pubs and nightclubs (i.e. pint, half and mixer glasses). Polycarbonate glasses are shatterproof and hard wearing, reducing replacement costs and making them safer than standard glass, which can shatter into splinters and shards. This can help reduce the impact and severity of glass-related injury in nightlife settings. Manufacturers claim that polycarbonate glasses are also more environmentally friendly, using only one-ninth of the energy in production compared with comparable standard glasses. Further, PCG is often made from recycled materials and is also 100% recyclable (Brewing Food and Beverage Industry Suppliers Association, 2008).

Some concern has been raised around the safety of polycarbonate due to the potential release of Bisphenol A (BPA), a chemical that may have developmental effects in newborns and young infants. BPA is released from polycarbonates when contact is made with boiling or hot water. An expert review in the US concluded it had negligible concern for reproductive effects in the adult population, but some concerns regarding exposure among pregnant woman and neural and behavioural effects in fetuses (Department of Health and Human Services, 2007). Concerns have largely focused around the use of polycarbonates for baby bottles. The Canadian government has reviewed the literature on this issue, focusing on newborns and young infants, and whilst exposure levels were found to be below those that could cause health effects, due to the uncertainty raised in some studies they are taking action to enhance the protection of newborns and infants (Government of Canada, 2008).

¹ Where glasses are treated to make them stronger and shatter into pieces rather than sharp shards.

observational research found that disorder in bars using the PCG incurred less injury compared to those continuing to use standard glassware. Furthermore, interviews with nightlife patrons found that they felt safer in bars using PCG than those that did not (Forsyth, 2008).

Despite the potential benefits of replacing standard glassware in bars, pubs and nightclubs with PCG, there are a number of factors that discourage such a change. The annual cost of replacing standard bar glassware in the UK is estimated to be £100m (Shepherd, 1998). Whilst PCG is more expensive to purchase than standard glassware, it would be envisaged that the durability of PCG would mean they last longer and therefore may become more cost effective. Further issues may include: public and licensee perceptions of the use of PCG, including negative effects on the drinking experience; and the impact on the environment in the venues using these glasses (e.g. PCG being discarded on the venue floor) (Forsyth, 2008). Even across the licensing trade, a debate exists as to whether venues should convert to PCG, with concerns expressed around the quality and range of the product, and customer perceptions (Eyre, 2007). An even greater debate exists around whether they should be introduced to all premises, or targeted at those most at risk (e.g. busy nightclubs; Forsyth, 2008) and during peak times (Eyre, 2007).

2. The Lancashire polycarbonate glass pilot project

In Lancashire, a joint pilot project was undertaken by police, health services and the Centre for Public Health at Liverpool John Moores University to provide PCG to pubs, bars and nightclubs in order to assess its use in preventing serious injury from violence. In addition, the pilot looked to assess the impacts a switch from standard glassware to PCG in licensed premises would have on the venue itself and also local services (e.g. police and health). The project was conducted in three areas in Lancashire: Burnley, Chorley and Preston. These areas were chosen to represent the different types of nightlife areas in Lancashire. In each participating area, between three and five licensed venues (PCG venues) were selected and recruited to change to PCG for a three-month period. The venues were selected by local neighbourhood police: selections were made to provide a representative sample of the different types of licensed premises in each area. For each venue recruited, a similar one from the area was also selected and recruited to act as a non-PCG venue, where possible matched to PCG venues by size and type.

Following discussions with venues, Lancashire Police provided each PCG venue with enough PCG to replace their entire glassware stock, matched to their current glass type usage (e.g. pint, half pint, wine, shot glasses). PCG were provided free of charge and provisions were made to provide additional glasses throughout the pilot project if required. Implementation of the PCG by area was staggered; PCG were introduced in Burnley, Chorley and Preston in February, March and May 2008 respectively. Requests were made to ensure PCG venues used the glasses consistently for the duration of the study period, whilst non-PCG venues continued to use standard glassware. Compliance with using PCG was measured periodically throughout the study period by police licensing staff and the project researchers.

3. Evaluation methods

To fulfil the aim and objectives of the study, multiple research methods were used.

3.1 Customer survey

A short customer survey was conducted in each venue (PCG and non-PCG) before the introduction of PCG and repeated after three months of implementation. The pre-trial survey aimed to provide baseline data on: customer perceptions of safety within venues and the surrounding nightlife area; perceptions and experiences of a range of negative nightlife behaviours (e.g. glass-related injury); and their perceptions of the use of PCG in licensed premises. The post-trial survey aimed to identify any changes in customer perceptions and experiences following the change to PCG. The survey was conducted opportunistically between the hours of 7pm and 11pm on Friday nights. Trained researchers approached potential respondents in each participating venue and asked if they had time to complete a short questionnaire. Those that did were provided with an explanation of the research (both verbally and via an information sheet). Researchers completed the questionnaire by interviewing participants on a one-to-one basis. A total of 482 individuals were approached during the study period of which 68 refused to take part in the survey before the purpose of the research was explained. No individuals refused to take part once the study had been explained to them. Overall, 178 customers completed the survey pre-trial and 236 post-trial.

3.2 Bar staff survey

A short bar staff survey was conducted in each venue (PCG and non-PCG) before the introduction of PCG. The pre-trial survey aimed to provide baseline data on: bar staff perceptions of violence and safety within venues and the surrounding nightlife area; their experiences of glass-related injury whilst in the workplace; and their perceptions of the use of PCG in licensed premises. Researchers provided staff working in participating venues with a questionnaire to be completed and returned in a pre-paid envelope (to maintain anonymity). Overall, 81 bar staff completed the survey pre-trial. A post-trial survey was also developed to assess the impact of PCG on such perceptions and experiences. However, no bar staff completed the survey post-trial, despite several attempts (e.g. through reminder letters and telephone calls to venue managers) by the researchers to obtain their views.

3.3 Venue observations

Based on pre-validated tools used in the US and Scotland, a venue assessment tool was designed to assess venue characteristics pre- and post-trial (Forsyth, 2008; Graham, 2000). Two field researchers observed each venue unobtrusively for up to one-and-a-half hours on Friday evenings between the hours of 7pm and 1am. Where possible, teams consisted of one male and one female. Researchers observed venues at known peak times (identified by local police and venue managers). The venue assessment observations took place from before entry (i.e. outside) and continued after exiting the venue, so researchers could observe venue characteristics as well as the immediate surrounding nightlife area. Venue managers were informed of the day the observations would take place, but not the time. Researchers entered the venue as customers: venue staff had not met the field researchers before. The venue assessment tool was completed jointly by the two researchers, either in a discrete location within the venue, or outside the venue once they had finished the observations. Where required, researchers were encouraged to take notes using their mobile phones.

3.4 Polycarbonate glassware venue licensee/manager interviews

Interviews were conducted with licensees/managers from all the venues using PCG as part of the pilot project after three months of implementation. The interviews were semi-

structured, conducted face-to-face or via telephone and lasted approximately half an hour. Interviews aimed to explore their perceptions on: the impact of using PCG on their business and staff and customer safety; customers' and staff reactions to the use of PCG; and the continued use of PCG in their venue and other nightlife venues.

3.5 Venue data collection

Both PCG and non-PCG venues were provided with a booklet to capture data on their venues before and during the trial. Data items included number of: glass injuries amongst staff and customers; broken bottles and glasses; incidents (e.g. fights); and details of events, weekly sales figures, and daily opening and closing times. Data were collected on a daily basis and provided to researchers (via telephone) on a weekly basis. The majority of venues completed the booklets fully throughout the trial. However, data were missing from four venues (one PCG and three non-PCG venues) for between one and three weeks during the trial due to staff illness or leave and temporary venue closure.

3.6 Emergency services data collection

Data were collected for the period of January 2007 to September 2008 from: Lancashire Police, as well as Preston and Chorley & South Ribble accident and emergency departments (AEDs). Data were analysed to identify any changes made in glass-related injury levels over the course of the project period, compared to the same period the year before.

3.7 Data analyses

Data were entered and analysed in the statistical package SPSS version 14. For the purposes of this report, analyses utilised descriptive statistics, chi squared and analysis of variance. Subsequent analyses will be undertaken to explore area and venue level factors.

3.8 Ethics

The research was reviewed and passed as ethical in its design and proposed implementation by Liverpool John Moores University Research Ethics Committee. All participants were offered a detailed description of the study.

3.9 Research training

All field researchers were provided with detailed training on how to conduct the observations and surveys safely within licensed premises.

3.10 Limitations

There are a number of limitations to this evaluation that should be considered when reading this report. The trial was implemented over a nine-month period in three areas of Lancashire in 2008. During this time an estimated 27 pubs closed each week in Britain, and beer sales in pubs were at their lowest level since the 1930s (British Beer and Pub Association, 2008). This had a great effect on the evaluation. Morecambe Bay was set to be included in the project; however this area was not included in the trial due to the large number of venues closing in the area and reluctance by licensees to participate due to low trade and concerns that using PCG would reduce trade even further. Furthermore, during the trial, two participating venues closed and two had a change of management, with new managers either refusing to participate in the pilot and/or collect data for the evaluation. A further four venues did not collect the booklet data continuously throughout the trial, with some only collecting data for a few weeks. Thus, in total, 22 venues agreed to participate, with 14 completing the trial; seven as PCG and seven as non-PCG venues (see Table 1).

There were also inconsistencies in the use of the PCG in venues using them as part of the trial. Two used partial implementation: mainly offering glass to regulars and using PCG for evenings, weekends and groups of young people drinking during the day. All other venues used it explicitly throughout the evaluation period. Perhaps an even greater consideration

was that glass bottles were still available to customers in the majority of venues, which did not eradicate the possibility of injuries among staff and customers from these vessels. One nightclub did dispense bottled drinks into PCG; however, this was not generally done elsewhere. The trial was introduced in each of the three areas in Lancashire at least a month apart. Similar research should consider implementing the trial at the same time to allow better comparisons between areas; the effects of the trial could be subject to natural variations in nightlife usage and trade throughout the year. However, use of venues not using PCG in each area sought to limit these effects.

There were also a number of data collection issues. Typically, in each participating venue only one member of staff (usually an assistant manager) was charged with completing data booklets, which meant that during times of annual leave or illness, data collection was often not completed, or estimated upon their return. Furthermore, researchers were unable to obtain post-trial questionnaires from bar staff, despite continued efforts to encourage them to complete the survey and return it to the researchers. Moreover, whilst researchers aimed to collect pre- and post-trial customer survey data from all venues, data were not collected from one PCG venue pre-trial and five venues post-trial (two non-PCG and three PCG venues). Finally, data from AEDs on attendances with glass and bottle-related injuries were only available from two AEDs (out of five), Preston, and Chorley & South Ribble, and thus data did not cover all trial areas. Also, data provided on police recorded crimes did not allow researchers to identify incidents occurring in specific venues participating in the project accurately and thus analyses of this data was done at the area level (e.g. Burnley).

Finally, given that only a small number of venues in each participating town adopted PCG, and that use of PCG was not consistent in all venues, comparisons between customer surveys conducted in PCG and non-PCG venues are limited. Nightlife users typically visit more than one bar over the course of a night out, meaning participants in PCG venues may well also frequent non-PCG venues, and vice versa.

Table 1: Venue compliance with the trial

Area	Type	Completed trial
Z	PCG a	No - Closed
	Non-PCG a	Yes
	PCG b	Yes - However, glass provided to regular customers
	Non-PCG b	No - Change of management
	PCG c	Yes
	Non-PCG c	Yes
	PCG d	Yes
	Non-PCG d	Yes
Y	PCG a	No - Insufficient data collected
	Non-PCG a	Yes
	PCG b	Yes
	Non-PCG b	No - Insufficient data collected
	PCG c	No - Closed
	Non-PCG c	Yes
	PCG d	Yes
	Non-PCG d	No - Insufficient data collected
X	PCG a	Yes
	Non-PCG a	No - Insufficient data collected
	PCG b	Yes - However, glass provided to customers who requested it
	Non-PCG b	Yes
	PCG c	No - Change of management
	Non-PCG c	Yes

4. Pre-trial findings

This section provides information from the baseline surveys on: staff and customer perceptions and experiences of safety and violence in the study areas; and their perceptions of PCG. Data from the police and local AEDs are presented to show the level of glass-related injury in the area prior to the trial being implemented.

4.1 Bar staff survey

Participant demographics

A total of 81 staff working in participating venues in Burnley (n= 26, 32%), Chorley (n= 23, 28%) and Preston (n= 32, 40%) completed a pre-trial survey. Surveys were completed in both PCG venues (60%) and non-PCG venues (40%) in all three areas. A significantly greater number of staff completed surveys in PCG venues in Burnley and Chorley (81% and 70% respectively) compared with 38% in Preston, ($X^2 = 12.34$, $p < 0.01$).

Participants were aged between 18 and 44 years (mean age 25) and 61% were female. There were no significant differences in age or sex between staff working in PCG or non-PCG venues. Surveys were filled in by a range of staff including bar tenders (74%), bar managers (9%) and other staff (18%) including landlord/landlady, cleaner, disk jockey and glass collector. Of the staff surveyed, most worked weekends (Friday and Saturday).

Staff perceptions of safety and violence

Staff were asked a range of questions that covered their perceptions of safety and violence both in the venue they worked in and in the local nightlife area. The majority (78%) of staff felt very or fairly safe in the local town at night. Furthermore, the majority felt safe from experiencing violence (93%). This was supported by similar findings for questions relating to the venue where they work, with the majority (98%) of staff feeling very or fairly safe in general, and safe from experiencing violence (93%). Eighty nine percent of staff stated that they felt very or fairly safe even when a fight took place in the venue where they work. Many stated this was because they had good security in their venue and door staff who can quickly respond to any situation. There were no significant differences in perceived levels of safety between genders.

Staff perceptions and experience of problems in their venue

Staff were asked questions on what they perceived to be a problem within their venue. The key issues identified were customers leaving glasses and bottles on the floor, and broken glass on the floor (see Table 2). There were significant differences between areas with 10% of staff in Preston stating that customer injuries from glassware were a fairly/very big problem compared with 4% in Burnley and none in Chorley ($X^2 = 20.73$, $p < 0.05$). There were also significant differences between areas for bottle assaults, with 15% in Preston stating it was a problem, compared with just 6% in Chorley and 4% in Burnley ($X^2 = 6.06$, $p < 0.05$).

Two-thirds (66%) of staff had cut themselves on a glass or bottle in the past three months. Six percent stated that they cut themselves on glass on every shift and 3% on a bottle.

Table 2: Staff perceptions of problems experienced in the venue where they work²

Problem	Not a problem	Slight problem	Fairly/very big problem
Excessively drunk customers	42%	53%	5%
Drinkers who look underage	38%	47%	16%
Accidents	67%	27%	6%
Customer injuries from glassware	75%	20%	5%
Staff injuries from glassware	65%	32%	4%
Arguments between customers	27%	57%	17%
Fights between customers	35%	46%	19%
Customers leaving glassware on floor	31%	39%	30%
Customers leaving bottles on floor	28%	45%	28%
Broken glassware on floor	38%	40%	23%
Broken bottles on floor	38%	41%	21%
Threats with a glass	82%	14%	4%
Assaults with a glass	84%	10%	6%

Staff perceptions of polycarbonate glassware

In all areas, four-fifths (81%) of staff stated that they had seen PCG and 71% had drunk out of PCG. Staff were asked a range of questions including what impact a change to PCG in their bar would have. Responses showed that participants believed such a change would increase feelings of safety amongst both staff and customers (Table 3). Furthermore, they thought that levels of broken glass on the floor would decrease, along with staff and customer injuries from glassware and accidents.

When asked if pubs, bars and nightclubs should change from standard to PCG, half (52%) of staff said yes, and a quarter (26%) had a mixed opinion. Forty two percent of staff reported preferring to drink alcoholic drinks from standard glassware themselves, although half (51%) stated they had no preference for either standard or PCG; and 6% stated PCG. Comments provided by staff on their reasons for favouring PCG included: fewer glass breakages and consequently cleaning of the venue would be easier and safer; and that PCG use would lower levels of glass-related injury amongst staff and customers. Six per cent of staff said they would be more likely to visit a venue that used PCG, while just over three-quarters (76%) said that whether a venue used PCG or standard glassware would not influence their choice to visit it.

Two-thirds (69%) of staff believed that a change to PCG would not affect a customer's decision to visit their venue, mainly because they felt that they would be unaware of a change in glassware and that patrons are attracted to a venue because of its atmosphere and the price of drinks, not the glassware used. Just under a quarter (23%) felt that PCG may discourage customers from visiting a venue. Reasons for this included: that they would perceive the venue to be less safe because it uses PCG, and because they may feel that PCG affects their drinking experience (e.g. the taste of the drink). Nearly half (49%) of staff thought customers preferred standard glassware, while just less than half (45%) stated either.

² Throughout this report figures have been rounded to the nearest whole number and therefore the totals may not add up to 100%.

Table 3: Perceived outcomes if bars changed from standard to polycarbonate glassware

Outcome	Bar staff perception of change in outcome:		
	No change	Increase	Decrease
Accidents	24%	24%	51%
Feelings of safety amongst staff	43%	51%	5%
Feelings of safety amongst customers	54%	43%	3%
Staff injuries from glassware	15%	23%	63%
Customer injuries from glassware	32%	17%	51%
Broken glass on the floor	15%	19%	67%
Bottles left on the floor	67%	17%	16%
Glasses (polycarbonate) left on the floor	41%	23%	37%
Perceived levels of violence in the venue	71%	9%	20%
Actual levels of violence in the venue	73%	7%	20%
Clearing of tables (collecting glasses)	78%	10%	12%
Clearing of glassware/bottles from the floor	77%	10%	14%

Differences between PCG and non-PCG venues

There were significant differences in responses between staff in PCG and non-PCG venues when asked how they thought a change to PCG would affect a range of nightlife harms. These differences may represent a greater awareness of PCG and the aim of the project among staff working in venues that had been recruited to change to PCG. Thus, two-thirds (65%) of staff in PCG venues said that the move would increase feelings of safety amongst staff, compared with 29% of those in non-PCG venues ($X^2 = 11.14$, $p < 0.01$). Similarly, half (54%) of those in PCG venues thought that feelings of safety amongst customers would increase, compared to 25% of those in non-PCG venues ($X^2 = 8.34$, $p < 0.05$).

Whilst 55%, 26% and 19% of those in PCG venues thought that customer injuries would decrease, increase or not change, respectively, results from staff in non-PCG venues were somewhat different (43%, 4% and 54% respectively; $X^2 = 11.92$, $p < 0.05$). Furthermore, whilst six in ten staff in both PCG venues and non-PCG venues (64% and 61% respectively) thought that staff injuries would decrease, three in ten (32%) of those in PCG venues thought that they would increase, compared to 4% in non-PCG venues ($X^2 = 14.09$, $p < 0.05$). A third (36%) of staff in PCG venues also stated that accidents would increase compared to 4% in those in non-PCG venues ($X^2 = 14.51$, $p < 0.05$).

4.2 Customer survey

Demographics

A total of 189 participants were surveyed before the PCG trial was implemented in Burnley (n=59, 31%), Chorley (n=63, 33%) and Preston (n=67, 35%). Surveys were completed in both PCG venues (51%) and non-PCG venues (49%). Participants were aged between 18 and 70 years (mean age 30 years) and 48% were female.

Customer perceptions of safety and violence

Customers were asked about their perceptions of safety, violence and nightlife problems in both the nightlife area as a whole and in the particular venue they were surveyed in. For the nightlife area, across the whole sample (PCG and non-PCG venues), the majority felt very or fairly safe whilst on a night out in Burnley, Chorley or Preston (see Table 4). Furthermore, over six in ten (63%) thought that the levels of violence within these nightlife areas were

very or fairly low. Participants did however highlight a range of nightlife-related problems. Key issues included arguments (70%), excessively drunk people (65%), underage drinking (62%) and fights (61%). Around half of participants stated that glasses and bottles, including broken glass, being left on the floor was also a problem (49% and 45% respectively), whilst a third stated that injuries from glassware were a problem (35%), along with assaults involving a bottle (34%) or a glass (33%). There were no significant differences between customers in PCG venues and non-PCG venues (in all three areas combined) regarding feelings of safety or perceptions of levels of violence in the nightlife area. However, the percentages of customers perceiving nightlife issues to be a problem in the area were higher in non-PCG venues than PCG venues. Differences were significant for injuries from glassware, arguments, fights, broken glasses/bottles on the floor, and assaults involving both glasses and bottles (Table 4).

When customers were questioned about the particular venue in which they were surveyed, the majority reported feeling very or fairly safe (see Table 5) and correspondingly, that levels of violence were very or fairly low. Key issues identified in venues included arguments (25%), excessively drunk people (24%) and underage drinking (19%). Just over one in ten stated that glasses and bottles, including broken glass, being left on the floor was also a problem (13% and 12% respectively), whilst less than ten percent thought that assaults involving a bottle (9%) or a glass (4%), or injuries from glassware (4%) were a problem.

A significantly greater number of customers in Preston venues felt that injuries from glassware were a problem compared with venues in other areas (52% compared with 25% and 26% in Chorley and Burnley respectively; $X^2 = 12.98$, $p < 0.05$). There were also significantly greater proportions in Preston (77%) stating that excessively drunk customers were a problem in the venue compared with Burnley (60%) and Chorley (57%) ($X^2 = 6.48$, $p < 0.05$). There were no significant differences in customer responses between those surveyed in PCG and non-PCG venues.

Table 4: Perceptions of safety, violence and concerns with other associated behaviours in the nightlife area

	Area				Study status		
	All	Burnley	Chorley	Preston	PCG venue	Non-PCG venue	P
<i>Perceptions of safety and violence in the area:</i>							
Feel very/fairly safe	90%	98%	84%	88%	90%	89%	ns
Perceive violence to be very/fairly low	63%	63%	69%	58%	64%	62%	ns
<i>Current nightlife issues in the area:</i>							
Underage drinking	62%	65%	57%	65%	58%	67%	ns
Excessively drunk people	65%	60%	57%	77%	60%	70%	ns
Injuries from glassware	35%	26%	25%	52%	26%	44%	*
Arguments	70%	72%	67%	72%	63%	78%	*
Fights	61%	65%	54%	63%	52%	70%	*
Glasses/bottles left on the floor	49%	51%	46%	49%	45%	52%	ns
Broken glass/bottles on the floor	45%	46%	44%	45%	37%	53%	*
Assaults involving a glass	33%	23%	32%	42%	24%	42%	*
Assaults involving a bottle	34%	26%	32%	42%	25%	43%	*

P represents the statistical difference between customer responses in PCG and non-PCG venues: * = $P < 0.05$, ns = difference not significant.

Table 5: Perceptions of safety, violence and concerns with other associated behaviours in study venues

	Area				Study status		
	All	Burnley	Chorley	Preston	PCG venue	Non-PCG venues	P
<i>Perceptions of safety and violence in the venue:</i>							
Feel very/fairly safe	96%	98%	90%	98%	96%	96%	ns
Perceive violence to be very/fairly low	90%	100%	84%	87%	88%	92%	ns
<i>Current nightlife issues in the venue:</i>							
Underage drinking	19%	25%	19%	14%	22%	16%	ns
Excessively drunk people	24%	25%	30%	17%	27%	20%	ns
Injuries from glassware	4%	0%	5%	6%	5%	2%	ns
Arguments	25%	21%	30%	25%	25%	26%	ns
Fights	11%	4%	16%	12%	14%	8%	ns
Glasses/bottles left on the floor	13%	12%	14%	12%	14%	12%	ns
Broken glass/bottles on the floor	12%	18%	10%	9%	10%	13%	ns
Assaults involving a glass	4%	4%	6%	3%	5%	3%	ns
Assaults involving a bottle	9%	4%	6%	15%	6%	11%	ns

P represents the statistical difference between customer responses in PCG and non-PCG venues: * = $P < 0.05$, ns = difference not significant.

Customer experience of negative nightlife behaviours

Participants were asked to identify whether they had been involved in a number of negative nightlife behaviours whilst in pubs, bars and nightclubs (in the nightlife area) during the past three months. Table 6 shows that a third (32%) had been involved in an argument and 18% in a fight. One in ten (9%) had been involved in an accident, 11% cut themselves on a broken glass and 7% had cut themselves on a broken bottle. Almost a tenth (8%) had also been threatened with a glass or bottle, and 2% assaulted with a glass or bottle. There were significant differences between areas in the proportion of customers stating they had cut themselves on broken glass or broken bottles.

Table 6: Proportion of participants experiencing negative nightlife behaviours in the past three months in the local area

	Area				Study status		
	All	Burnley	Chorley	Preston	PCG venue	Non-PCG venue	P
Been involved in an accident	9%	3%	10%	14%	12%	7%	ns
Cut yourself on broken glass	11%	2%	11%	19%	11%	11%	ns
Cut yourself on a broken bottle	7%	0%	8%	12%	6%	8%	ns
Been involved in an argument	32%	35%	30%	33%	28%	37%	ns
Been involved in a fight	18%	19%	18%	17%	17%	19%	ns
Been threatened with a glass	8%	7%	8%	10%	9%	8%	ns
Been threatened with a bottle	8%	5%	8%	11%	7%	9%	ns
Been assaulted with a glass	2%	2%	2%	2%	1%	2%	ns
Been assaulted with a bottle	2%	0%	1%	2%	1%	3%	ns

P represents the statistical difference between customer responses in PCG and non-PCG venues: * = $P < 0.05$, ns = difference not significant.

Customer perceptions of polycarbonate glassware

The majority of customers in Burnley and Chorley had seen a polycarbonate glass (75% and 71% respectively) compared with 52% in Preston ($X^2 = 12.68$, $p < 0.05$). Corresponding, only 43% of participants in Preston stated that they had drunk out of a polycarbonate glass compared to 73% in Burnley and 64% in Chorley ($X^2 = 14.58$, $p < 0.05$).

Over six in ten (61%) of all customers thought that venues should change from using standard to PCG. Key reasons for this included PCG being safer (through reductions in injuries and serious violence), unbreakable, and more environmentally friendly than standard glassware. A fifth of customers had mixed opinions (20%) and a further fifth (19%) thought that venues should not change their glassware to PCG. Reasons for this involved a perceived change to the drinking experience, the expense of changing to polycarbonate and cleanliness. Four in ten (42%) customers stated that they did not mind which type of glass their alcoholic drink was served in, whilst 37% would prefer to drink out of a standard glass and 14% PCG; 7% did not know. Key reasons for preferring standard glass included the perception that PCG affects the taste of alcohol and their drinking experience (e.g. think the drink goes flat more quickly, or PCG warms the drink). The majority (81%) of participants stated that the use of PCG would not affect their decision to visit a venue, whilst 12% stated they would be more likely to go to a venue if it used PCG and 7% less likely.

When asked for their perceptions on the impact PCG would have on a range of issues (Table 7), the majority thought that feelings of safety among customers and staff would increase. Further, the majority felt that both customer and staff injuries would reduce, along with the level of broken glass on the floor. There were significant differences between study areas for several questions relating to the perceived impact of PCG. In Preston, a higher proportion thought that staff and customer injuries would increase compared to Burnley and Chorley. A higher proportion of customers in Burnley thought that feelings of safety amongst customers and staff would increase compared to Preston and Chorley. Whilst 73% of those in Preston thought that PCG would decrease levels of broken glass on the floor, the figures in Burnley and Chorley were 61% and 57% respectively ($X^2 = 10.08$, $p < 0.05$). Significantly more customers in Chorley thought that the clearing up of tables in venues would increase (Chorley 16%, Burnley 2% and 8% Preston; $X^2 = 10.92$, $p < 0.05$).

There were also significant differences between gender and perceptions of safety with more women saying that PCG would increase feelings of safety. There were no significant differences in responses between PCG and non-PCG venues.

Table 7: Customers perceptions of the impact of polycarbonate glassware on a range of outcomes

Outcome	Customer perception of change in outcome:		
	No change	Increase	Decrease
Feelings of safety amongst customers	27%	67%	5%
Feelings of safety amongst staff	19%	75%	6%
Customer injuries from glassware	14%	15%	71%
Staff injuries from glassware	16%	14%	71%
Levels of violence in the venue	65%	4%	31%
Glasses (polycarbonate) left on the floor	55%	26%	19%
Bottles left on the floor	68%	11%	21%
Broken glass on the floor	27%	9%	64%
Clearing of tables (collecting glasses)	74%	8%	17%

4.3 Police and accident and emergency department data

In 2007, there were 551 incidents of glass/bottle-related violent crime recorded by Lancashire police (across the whole of Lancashire). Four in ten (n=220; 40%) of these incidents occurred inside or surrounding a licensed premise (bar, pub, nightclub). The majority (82%) of incidents involved some form of injury, 76% of which were to the person's head, face or neck. More than three-quarters (79%) of glass/bottle-related violent crime occurred between 9pm and 2.59am, and 83% took place at the weekend (Friday 18%, Saturday 31% and Sunday 34%).

Data from Preston, and Chorley & South Ribble AEDs show that in 2007 there were 83 attendances to these AEDs recorded as involving a glass or bottle-related injury. Data for other AEDs were not available, and thus the total number of such attendances to AEDs across Lancashire is not known. Data used here show that the majority (86%) of these attendances involved an injury to the head or neck, including the face, with 8% of cases being admitted to hospital. Two-thirds (69%) of incidents were recorded as occurring in a public place, and of these 70% attended the AED between the hours of 9pm and 2.59am. The majority (79%) attended the AED during the weekend (Friday 20%, Saturday 25% and Sunday 34%).

5. Impact of using polycarbonate glassware on a range of health, criminal justice and venue trading outcomes

To explore the impact of the introduction of PCG on health, criminal justice and venue trading outcomes, a range of data sources were assessed including information from: PCG venue licensee/manager interviews; pre- and post-trial customer survey; and local police and AEDs. The post-trial bar staff survey was not returned and thus such data are not included here.

5.1 Customer and staff injuries

Interviews with venue managers/licensees from PCG venues post-trial suggested that PCG had proved much safer than standard glassware. They stated that as they had observed fewer glass breakages, they considered PCG to have a range of health and safety benefits for customers and staff, with a noticeable reduction in glass-related injuries since their implementation. They commented that using PCG made it much easier to keep their venue clean and safe as glass collectors were able to easily stack the PCG without worry of injuring themselves or others, or accidental breakage. They could also collect more PCG in one occasion.

“It’s been a great success. Huge amount of health and safety benefits. Less staff obviously cutting themselves, and less customers with little cuts on their toes.” Club 3

“I think this trial has been a very positive one for us. Even the glass collectors say it’s fantastic and they feel much safer going into a crowd when the nightclub’s packed. The positive thing for us is there’s not the litter at the end of the day as there is with clearing up broken glass. There’s not the injuries either.” Club 4

“In general, it’s much easier, less broken glass for the staff.” Bar 7

Data collected by the venues on a daily basis supported the noticeable reduction in glass breakages in PCG venues, reducing from an average of 17 per week (per venue) pre-trial to zero per week during the trial (F=13.78, p<0.01). Significant reductions were not observed in the non-PCG venues. There was also a reduction in bottle breakages in PCG venues

(weekly average per venue pre-trial 13, post-trial 10) but this was not significant (no change was observed in non-PCG venues). However, whilst the number of customer and staff injuries recorded by PCG venues was low pre- and post-trial, the number decreased during the trial, whereas staff injuries in non-PCG venues decreased and customer injuries increased slightly. As highlighted in the methods section, there are limitations to the data collected by venues as it was not always consistently recorded, and thus these findings should be viewed with caution.

Analyses of the customer survey showed that the proportion of participants in PCG venues cutting themselves on broken glass whilst in venues in the study area (in the past three months) decreased from 11% pre-trial to 6% post-trial. Whilst this difference was not significant, the same data from non-PCG venues showed a slight increase, from 11% to 13%.

As noted in the methods section, health data were only available from Preston, and Chorley & South Ribble AEDs. Analyses of these data show that there was no significant difference in the number of attendances due to a glass or bottle-related injury when comparing incidents occurring during the Preston and Chorley trial periods and those occurring in the same period a year earlier (Preston: pre-trial = 33, post = 32; $F= 0.02$, $p=0.88$ / Chorley: pre = 20, post = 22; $F= 0.07$, $p=0.81$). However, given the small number of premises involved in the trial and the continued use of standard glassware in most venues in the study areas, this is not surprising.

5.2 Customer perceptions of safety and levels of violence

Table 8 examines customer perceptions of safety and violence in the nightlife area and the venue of survey, comparing pre- and post-trial survey responses. Notably, the proportion of customers thinking that the nightlife area had a problem with assaults involving glasses or bottles was significantly higher in the post-trial survey in PCG venues; in non-PCG venues the proportion of customers thinking both assault types were a problem decreased, but not significantly. This increase in PCG venue customers' perceptions of glass-related violence may well be due to increased awareness of PCG and reasons for its use amongst customers using venues where PCG has recently been introduced. Thus, the fact that PCG has been introduced may make customers think the area has a problem with glass-related violence, regardless of their own experiences. Importantly, despite the increased perceptions of glass-related violence in the nightlife area, there were no significant changes in customers' perceptions of any glass-related problems within PCG venues themselves. Higher proportions of PCG venue customers did consider arguments and violence to be a problem in the venues post-trial, compared to pre-trial; however, these differences were not significant.

In non-PCG venues, the proportion of customers considering arguments and fights to be a problem in the local nightlife area decreased significantly over the trial period. However, rates of both problems were higher than in PCG venues pre-trial, with post-trial findings similar to those in PCG venues. The proportion of customers surveyed in non-PCG venues that felt very safe in the venue decreased significantly between pre- and post-trial surveys. The proportion of non-PCG venue customers considering arguments, broken glasses/bottles on the floor and assaults involving bottles to be a problem in the venue where they were interviewed, also decreased significantly over the trial period.

Table 8: Customer perceptions of safety and violence in the nightlife area and in the venue in which their survey took place, pre- and post-trial, by venue status

	PCG venues			Non-PCG venues		
	Pre	Post	P	Pre	Post	P
<i>Perceptions of safety and violence in the area:</i>						
Feel very/fairly safe	90%	83%	ns	89%	86%	ns
Perceive violence very/fairly low	64%	67%	ns	62%	70%	ns
<i>Current nightlife issues in the area:</i>						
Injuries from glassware	26%	39%	ns	44%	35%	ns
Arguments	63%	56%	ns	78%	55%	*
Fights	52%	51%	ns	70%	55%	*
Glasses/bottles left on the floor	45%	50%	ns	52%	57%	ns
Broken glass/bottles on the floor	37%	51%	ns	53%	53%	ns
Assaults involving a glass	24%	43%	*	42%	34%	ns
Assaults involving a bottle	25%	44%	*	43%	36%	ns
<i>Perceptions of safety and violence in the venue:</i>						
Feel very/fairly safe	96%	91%	ns	96%	91%	* ¹
Perceive violence very/fairly low	88%	78%	ns	92%	93%	ns
<i>Current nightlife issues in the venue:</i>						
Injuries from glassware	5%	9%	ns	2%	4%	ns
Arguments	25%	33%	ns	26%	12%	*
Fights	14%	21%	ns	8%	8%	ns
Glasses/bottles left on the floor	14%	13%	ns	12%	11%	ns
Broken glass/bottles on the floor	10%	11%	ns	13%	5%	*
Assaults involving a glass	5%	7%	ns	3%	5%	ns
Assaults involving a bottle	6%	6%	ns	11%	4%	*

P represents the statistical difference between customer responses pre- and post-trial: * = $P < 0.05$, ns = difference not significant.

¹ Significance was measured across four categories of: very safe, fairly safe, fairly unsafe and very unsafe. Responses shown are combined responses for very and fairly safe. The significant difference here represents a drop in the proportion of individuals feeling very safe (74% to 47%) and an increase in those feeling fairly safe (21% to 44%). This shift from very to fairly safe did not occur in PCG venues.

Analyses of customer perceptions of the impact of PCG pre- and post-trial found some interesting results (Table 9). There were no significant differences between PCG venue customers surveyed pre- and post-trial in perceptions of the impact of PCG on staff or customer feelings of safety; however, the proportion of respondents in non-PCG venues thinking that PCG would increase safety levels dropped significantly between the pre- and post-trial surveys. In PCG venues, customers surveyed post-trial were significantly less likely to think that PCG would decrease customer and staff injuries. For example, pre-trial 72% of participants thought the use of PCG in bars would decrease customer injuries from glassware, however, post-trial, only 40% of participants stated this ($X^2 = 16.26$, $p < 0.05$; see Table 9). In fact the proportion stating customer injuries would increase changed from 15% to 37%. There was no significant difference in non-PCG venues. Furthermore, pre-trial only 8% of PCG customers felt that if bars changed to PCG, levels of violence in the venue would increase; post-trial this increased to 27% ($X^2 = 11.65$, $p < 0.05$). However, similar findings were seen in non-PCG venues ($X^2 = 9.07$, $p < 0.05$). As found elsewhere, banning standard glassware in venues is not viewed as a useful strategy in reducing aggression, rather researchers suggest more needs to be done to remove aggressive people from nightlife (Winder and Wesson, 2006).

There was also a significant difference in participant perceptions of the impact on levels of broken glass on the floor in PCG venues pre- and post-trial. Pre-trial, 58% thought this

would decrease compared with 45% post-trial ($X^2 = 7.46, p < 0.05$). There was no significant change in non-PCG venues. Reasons for these findings are unknown, however, it is possible that as some PCG venues still used standard glass, there may have been no change in levels of broken glass on the floor (as suggested by the observational data analyses; see section 5.5). Thus, this may have led to fewer customers perceiving that a change to PCG would reduce levels of broken glass on the venue floor.

5.3 Levels of violence

Analyses of data show that there was no significant difference in the number of glass or bottle-related police-reported incidents occurring during the Burnley, Chorley and Preston trial periods and those occurring in the same period a year earlier. Given the fact that only a small number of licensed premises in each area were involved in the trial this is not surprising. Data collected by venues themselves found that for both PCG and non-PCG venues, the number of observed incidents (e.g. fights) occurring in the venue pre- and post-trial was low (e.g. less than one per week).

In both PCG and non-PCG venues, customer survey findings showed no significant differences pre- and post-trial in the proportion of individuals who (in the last three months) had been: involved in a fight in pubs, bars or nightclubs; threatened with a bottle or glass; or assaulted with a bottle or glass, in the local nightlife area.

Table 9: Customer perceptions of the effects of polycarbonate glassware on a range of outcomes, pre- and post-trial, by venue study status

		PCG venues				Non-PCG venues			
		Customer perception of change in outcome:				Customer perception of change in outcome:			
Outcome		No change	Increase	Decrease	P	No change	Increase	Decrease	P
Feelings of safety in customers	Pre	28%	65%	7%	ns	27%	70%	3%	*
	Post	33%	60%	7%		43%	49%	8%	
Feelings of safety in staff	Pre	19%	73%	7%	ns	20%	76%	4%	*
	Post	23%	70%	8%		33%	60%	7%	
Customer injuries from glassware	Pre	13%	15%	72%	*	15%	15%	70%	ns
	Post	22%	37%	40%		24%	18%	58%	
Staff injuries from glassware	Pre	15%	13%	72%	*	16%	14%	70%	ns
	Post	20%	36%	44%		26%	17%	56%	
Levels of violence in the venue	Pre	64%	8%	28%	*	66%	0%	34%	*
	Post	44%	27%	30%		69%	7%	24%	
Levels of bottles on the floor	Pre	70%	14%	15%	*	59%	18%	23%	ns
	Post	46%	26%	28%		63%	21%	16%	
Levels of broken glass on the floor	Pre	32%	11%	58%	*	66%	7%	27%	ns
	Post	28%	28%	45%		66%	12%	23%	

P represents the statistical difference between customer responses pre- and post-trial: * = $P < 0.05$, ns = difference not significant.

5.4 Venue sales

Interviews with licensees/managers from PCG venues suggested that the use of PCG had not had any effect on their business. For example, they felt that there had been no change in sales during the trial and no shift in customer purchases (e.g. from pints to bottles). In fact, analyses of weekly sales figures show that there was no significant difference between pre-trial sales and sales during the trial in either PCG or non-PCG venues. PCG licensees/managers stated that the PCG were actually more cost effective as they lasted

much longer than standard glass as they do not break, are reusable and can eventually be recycled.

“I haven’t had to order as many glasses as I usually do.” Bar 2

“No I wouldn’t say it affected it [trade and business] in anyway whatsoever, other than maybe less breakages.” Club 3

“We’ve had no bad reaction whatsoever to polycarbonate. They’re just as good, if not better than glass. They’re quite a robust vessel and they’ve stood up really well. Initially I did think people would shy away from them, but it’s not affected business at all and it’s been a very positive move for us.”
Club 4

Pre-trial, the majority (79%) of customers surveyed in PCG venues stated that whether a bar used PCG or not would not influence their decision to visit that venue; 11% of customers said they would be more likely to visit a bar if it used PCG, and 11% less likely. Post-trial, the proportion being more likely to visit a bar if it used PCG had increased significantly to 27%; 58% said a bar’s glassware would not influence them, while 15% that they would be less likely to visit a PCG bar. Within non-PCG venues, the proportion stating that they would be less likely to visit a PCG bar increased significantly from 12% to 18% ($X^2 = 9.09$, $p < 0.05$). The proportion saying they would be more likely to visit a PCG bar remained low at 11%, compared with 13% pre-trial. There were no significant differences by age in whether or not PCG use would influence participants’ decisions to visit a bar. However, a higher proportion of those in the 40-70 year age group (27%) said they would be less likely to visit a PCG bar (compared with 16% of 17-25 year olds and 14% of 26-39 year olds).

5.5 Venue environment

Licensees/managers from PCG venues highlighted that PCG was lighter in weight than standard glassware, and consequently, they were easier to knock over when not full. Despite this, data collected through the observations showed that there was no change in the levels of glass on the venue floor or surfaces, nor were there any changes in the cleanliness of the bar.

“They do knock over quite easily because they are tall [hi-ball glasses]... that would be their only downfall.” Bar 1

“The only problem is the weight... of them. If they could put a weight in the bottom it would be better.” Bar 5

5.6 Drinking experience

Whilst the majority of customers felt that the use of PCG did not change their drinking experience, a number of effects were highlighted. Some felt that it made people feel safer whilst in venues and thus improved their drinking experience, with one customer highlighting that if a bar used PCG they would feel more at ease if their daughter were to visit the venue. Despite this, some customers stated that they did not like PCG as it altered the taste of the drink and made the drink warm quicker; however many others did not think PCG affected the drinking experience. Moreover, comments from licensees/managers in PCG venues suggested the opposite. They thought that the PCG did not affect the drink at all, and if it did, it seemed to keep the drink cooler for longer and the head stayed on the pint for longer. Some customers did not like the use of PCG simply because they felt like they were being treated like a child.

“It does help keep the drink cold, that’s the feedback we’re getting from clientele.” Club 4

“I think it actually makes the drink cooler and actually keeps the head on it.” Bar 5

“I think the drink looks better in the polycarbonate.” Bar 7

5.7 Acceptability of using polycarbonate glassware in venues

Licensees/managers from PCG venues stressed that they were initially sceptical about the use of PCG in their venues. Key reasons included: the tradition of using standard glassware; fear of the public’s reaction to change; and the perceived reduced quality of PCG (they were deemed to be lighter, thinner and easier to knock over). In addition, they were concerned that the use of PCG may discourage customers from coming into the venue. It was felt the public would view their use as a sign that the venue required such glassware as it was an unsafe or violent venue. Consequently, they would be less likely to visit the venue leading to a reduction in trade (however, as noted above, there was no change in trade during the trial, however there may have been a change in customer type).

“Mixed really, I like the idea, obviously because broken glass is used with glassing people and accidents and one thing and another, but I’ve never liked drinking out of polycarbs... but these are a lot better than anything I’ve had before.” Bar 1

“I think initially we thought that people would be against it because the polycarbs we’ve had before had been quite low quality. We thought that it would have a bad effect on the customers; we thought that they’d think ‘well I’m not going in there for a plastic glass’, and we thought that possibly they might go somewhere else.” Club 3

“Fortunately I think a lot of the custom is every week custom so they actually know the venue, they know that there’s no trouble there. However if it was someone from out of town or if I went to a venue and I’d been to a couple around it that didn’t have polycarbs and this one did, maybe I would think that [it was unsafe].” Club 3

However, upon receiving the PCG, licensees/managers were more than happy with their quality and agreed to implement them as part of the trial.

“They were quite robust and not at all like how I imagined them to be. I did think people would shy away from them, but it’s not affected business at all.” Club 4

“I thought the polycarbonate glasses may have been a bit horrible, but I’m personally impressed by them.” Pub 5

“I was pleased with the glasses I got because they’re nice and thick, you couldn’t really tell they weren’t glass until you picked them up.” Club 2

In fact, it was felt that the quality of the PCG was such that customers did not always notice the change in glassware. In the post-trial survey customers were asked whether they had drunk out of a PCG. Six in ten (63%) of those drinking in PCG venues stated they had drunk out of a PCG; 11% were unsure and 24% stated they had not. Whilst some PCG venues used a mix of PCG and standard glassware, at the time of survey implementation (weekend evenings), most bars were using PCG and thus participants were generally drinking out of them, even if they were unaware.

“I think they’re very very good. A lot of people have not noticed it’s polycarbonate until they’re halfway down the glass.” Pub 5

Licensees/managers highlighted that those that did notice the change in glassware were happy to drink out of it once the reason for using PCG had been explained to them.

“Some [customers] have moaned and when I’ve told them, then they’ve asked me why they’re plastic and I’ve said there’s a survey with the university and with the licensing officer, they’ve been fine.” Bar 2

“A lot of people like them [polycarbonate] to be honest and we’ve had no derogatory comments.” Club 4

Findings from the customer surveys showed that there was no significant change in the proportion of those in PCG venues stating that pubs, bars and nightclubs should change from standard glassware to PCG (pre-trial 60%, post-trial 68%). In non-PCG venues, however, the proportion of respondents thinking pubs, bars and nightclubs should change to PCG decreased significantly, from 62% pre-trial to 46% post-trial. There were no significant changes in non-PCG venues in the types of drinking vessels customers preferred to drink out of (14% PCG pre- and post-trial). However, in PCG venues the proportion stating they would prefer to drink from PCG increased significantly, from 16% pre-trial to 29% post-trial.

Across all participants surveyed post-trial, there were no significant differences in the proportion of customers thinking that pubs, bars and nightclubs should change to PCG by age. Around half of participants in all age groups (age 17-25, 56%; age 26-39, 49%; age 40-70, 47%) thought venues should change to PCG, while less than a quarter (age 17-25, 24%; age 26-39, 23%; age 40-70, 17%) thought they should not, and the remainder had mixed opinions. However, age was significantly related to the type of glassware participants preferred to drink out of. Over two thirds (69%) of those aged 40-70 years stated they preferred to drink out of standard glassware compared to 41% of 26-39 year olds and 39% of 17-25 year olds. A fifth of both 17-25 year olds (21%) and 26-39 year olds (20%) stated they preferred PCG, compared to 10% of 40-70 year olds. The remainder in each age group did not mind which glassware they drank from.

Despite this, there were a few venues that said they had adapted the use of PCG according to complaints they had received. Consequently, PCG were implemented in different ways. Licensees/managers highlighted that a small number of their regular drinkers did not want to use PCG, all other customers did not mind. Generally, it was felt that younger drinkers were least likely to complain. One bar manager provided an example of having to repour a drink from a PCG into a standard glass at the request of the customer. Most venues used PCG all the time; however, some used it only during the evenings and weekends or gave standard glassware to customers upon request.

“The older ones are used to what they’re used [to] and the young ones they’re not bothered as long as they’re getting a drink.” Pub 5

“People aren’t bothered as long as there’s beer. They’ve got the option and you get to know who wants glass.” Bar 6

5.8 Licensee/manager thoughts on future use of polycarbonate glassware

Overall, licensees/managers were quite positive about the pilot PCG trial and were happy that they had taken part.

“Definitely worth it, glad we did it, this place needed it at the time...they [customers] were smashing glasses and being general pricks. Yeah, they’ve [polycarbonate glasses] been magic.” Bar 1

“I think it’s a good idea myself. I’m very happy, as I said I will be continuing to use them, it brings down my broken glasses a bit.” Bar 2

“In a nutshell we will certainly be carrying on, the benefits far outweigh the small disadvantage of [a few] customers [not liking them]. Glad we did it, and we’ll be carrying it on, happy to take part and for your research.” Club 3

“I think this trial has been very positive for us. Anyone else trying polycarbonate wouldn’t have anything negative to say about them.” Club 4

Consequently, all licensees/managers taking part in the trial stated that they would continue to use PCG for the foreseeable future for a number of reasons, including: reduced cost; perceived improvements in staff and customer safety; and reductions in serious injury from violence. A number of interviewees also expressed interest in expanding the types of PCG they have to include shot glasses, for example.

“Yes I’m going to carry on using them definitely. It’s cost effective because I’m not having to buy new glasses all the time... they’re expensive to buy but obviously in the long term they’re a lot better.” Bar 1

“Oh yes definitely, [they’re] a lot better, safer, easier. I will be continuing to use them.” Bar 2

“Financially it’s a no-brainer; yes both financially and practically its benefits far outweigh any disadvantages.” Club 3

“It pays for itself really. Yes, it’s slightly dearer than glass but they last maybe four to six times longer. I’ve not had to replace any of the polycarbonate glasses I’ve been given [as part of the trial]. There’s no way I’d go back to having glass in here, not a chance.” Club 4

“Personally I would carry on using them, but we have a new manager now so I’m not sure.” Bar 7

While they agreed that they would continue using PCG, not all thought that it was necessary to have them in all nightlife venues. There were mixed views, particularly around the type of bar that should use PCG and at what times such glasses should be used, with some stating that it is advantageous to use them during busy periods including evenings and weekends. It was generally accepted that nightclubs should definitely use them because of the clientele and large volumes of customers visiting such venues over a short period of time.

“Yes, I don’t see why not, I’d be annoyed if I went to a bar and fell and slipped on some broken glass.” Bar 1

“Yes, especially in nightclubs, definitely, it would be a good idea if they brought all plastic bottles in to be honest with you, because you know some of these events that go on, they’ll end up killing somebody one day.” Bar 2

“They’re fantastic and I really do wish the whole country would embrace them, and the drinks industry, as they’re a really good innovation. There’s no way we’d go back to glass at all. I think they’re good for the industry and I think the government should really take it on board and push it to every licensed venue. I think they’re fantastic, excellent.” Club 4

“All places should have it, especially nightclubs and for smaller venues with discos.” Bar 6

“I think if there’s going to be any point to them [polycarbonate] then everybody needs to use them don’t they” Bar 7

While bottled drinks, such as beer and alcopops, are available in polycarbonate bottles, it was highlighted that the current quality of them was not to the same standard as the glasses (e.g. they are flexible) and therefore they were less likely to consider using these instead of traditional glass bottles. Furthermore, it was felt that they cost a lot more than, and do not lead to cost savings like, PCG.

“I’ve had a polycarb bottle and the view that I had of polycarb glasses before, I’ve got it from the bottle, cos I had the bottle and it went warm and you can squeeze it together and beer came out the top. I think they haven’t quite got the technology yet, and there’s also cost implications, they’re more expensive.” Club 3

“They’re [polycarbonate bottles] roughly about £5-£6 more expensive a case to buy. It’s a lot dearer and I don’t really know why. We would look to get them. It’s all to do with cost, if it’s more expensive then that’s passed onto the customer and competition is fierce between the industry and supermarkets.” Club 4

6. Discussion

The Lancashire polycarbonate glass pilot project aimed to explore the impact of replacing standard glassware in pubs, bars and nightclubs with PCG on preventing serious injury from glass, as well as customer perceptions of safety and violence, and the effects on the venues themselves (e.g. premise trade). Baseline data collected as part of the evaluation from staff and customers in participating venues and from local health and criminal justice services provided an understanding of the impact of glass-related injury in the study areas, and consequently, the importance of trying to tackle the issue. Across Lancashire, over 500 incidents of glass/bottle-related violent crime were recorded in the year preceding the study, 40% of which occurred in or around a licensed premise. Whilst this places great burdens on local police services, further impacts are seen on local AEDs through treating associated injuries. In 2007, there were 83 glass-related attendances to Preston, and Chorley & South Ribble AEDs, 8% of which were admitted to hospital, placing more pressure on health resources. With many glass-related injuries recorded by the police and health services being sustained to the face, head and neck area, this may lead to further psychological impacts for victims, along with permanent scarring (Tebble et al, 2004). In addition to intentional injury from glass, unintentional injuries from glassware were also evident amongst bar staff and customers.

With PCG being virtually unbreakable, it would be expected that their introduction in bars and nightclubs would reduce the level of serious injury from violence and accidents. Here, there were significant decreases in the number of glass breakages in PCG venues, from an average of 17 per week (per venue) pre-trial to zero per week during the trial. Whilst the number of customer and staff injuries recorded by PCG venues was low both pre- and post-trial, there were reductions in both staff and customer injuries after the introduction of PCG. In non-PCG venues staff injuries also decreased during the trial period, but customer injuries increased. Together, these findings suggest that use of PCG can reduce glass-related injury. Such reductions were observed by licensees/managers using PCG as part of the trial, who highlighted the large health and safety benefits using such glasses had for their staff and customers. Whilst there were no significant reductions in glass or bottle-related injury attendances to local AEDs, or recorded through police data, during the trial period, this is not surprising given the fact that only a small number of licensed premises in each area were involved in the trial. Such impacts may only be realised if a greater number of venues converted to PCG.

Data collected from venues suggests that levels of violence occurring pre- and during the trial remained low (e.g. less than one incident in a venue per week). However, the introduction of PCG does not intend to reduce violence per se, only the potential of injury through their use as a weapon. Consequently, such interventions should be implemented as part of a wider strategy that aims to prevent violence as well as reduce its impacts. It has been argued that a change to PCG may create a self-fulfilling prophecy, where customers may perceive the removal of glass as a sign that they cannot be trusted and are expected to be violent. As such, this may affect their behaviour in a negative way (Winder and Wesson, 2006). Whilst this study could not assess whether there had been a change in clientele visiting the PCG venues, or their behaviour, there were no significant differences in the proportion of customers surveyed pre- and post-trial in either PCG or non-PCG venues that had been: involved in a fight in pubs, bars or nightclubs; threatened with a bottle or glass; or assaulted with a bottle or glass. More importantly, however, while there were no significant changes in customers' perceptions of violence in PCG venues pre- and post-trial, the proportion thinking levels of violence were very or fairly low decreased from 88% pre-trial to 78% post-trial. Further, although changes were not significant, the proportions in PCG venues thinking that fights, injuries from glassware and arguments were a problem in the venue increased. No such increases were seen in non-PCG venues, where significant decreases were seen in the proportions thinking arguments, broken glass/bottles on the floor and assaults involving bottles were a problem in the venue. These findings suggest that customers may perceive the adoption of PCG by individual venues as a marker of violence and glass-related problems in those venues. No attempts were made before or during the trial to raise public awareness of the reasons for introducing PCG in participating venues. Combining the introduction of PCG with a public awareness campaign that highlights the safety benefits of PCG in protecting both customers and staff from injury, and shows venues that use PCG to be acting responsibly rather than responding to a violence-related problem, may help overcome any negative impacts on customer perceptions.

Related to customer perceptions, it has been suggested that there is reluctance by licensees to use PCG due to the perceived negative impact it may have on venue trade. However, here data shows that there was no significant impact on venue sales. In fact, venues using the PCG highlighted savings they had made due to PCG lasting much longer than standard glassware. Customer perceptions of PCG and the impact it has on the drinking experience have also been highlighted as a concern and consequently a barrier to their use in nightlife venues (Eyre, 2007). Here, however, few customers felt that PCG affected their drinking experience. Even when comments were made, customer views were both positive and negative. Positive comments included that they felt safer and thus this improved their drinking experience. Whilst a few participants stated that PCG altered the taste of the drink, others, including licensees/managers in venues using the PCG, did not agree, stating that PCG may even keep the drink cooler for longer. Ensuring a change to PCG does not affect the customer drinking experience is important to ensure trade is not affected. Here, the most obvious difference identified between PCG and standard glassware was the weight of the PCG vessels, which are much lighter than standard glassware. Weighting PCG at the manufacturing stage would help overcome this, and provide drinkers with a vessel barely distinguishable from glass.

Research in Glasgow found that PCG in bars and nightclubs were discarded carelessly by customers, for example being thrown on the floor, and consequently their use increased littering and spilt drinks across the venue environment (Forsyth, 2008). Whilst some licensees/managers highlighted that, due to their lighter weight, PCG were more likely to be knocked over than standard glassware, such impacts on the venue environment were not observed. There were no changes in levels of glass on the venue floor, or the levels of cleanliness of the bar, before and after the introduction of PCG. Thus, it is not surprising that the proportion of customers in PCG venues that thought the use of PCG would

decrease broken glass on the floor reduced significantly pre- to post-trial. As some PCG venues still used standard glass during the trial, these venues may have still had broken glass on the floor. Keeping a venue clean and surfaces free of empty drinking vessels is an important part of good venue management, and such management is important in preventing the potential for violence in the first place.

The acceptability of PCG in venues using them in the trial would seem to be good, particularly amongst licensees/managers. Those using PCG were so impressed with them that they all stated that they would continue to use them after the trial had ended. Reasons for this included reduced cost. Thus, whilst PCG is more expensive to purchase, their durability means they last longer and do not have to be replaced as often as standard glassware. Perceived improvements in staff and customer safety and reductions in serious injury from violence were also highlighted by licensees/managers as key reasons for their continued use. Even amongst customers, the proportion in PCG venues stating that they preferred to drink out of PCG increased post-trial; glassware preferences were significantly related to age with older customers being less likely than younger ones to prefer PCG. However, age did not affect participants' perceptions of whether pubs, bars and nightclubs should change to PCG, with around half in all age categories agreeing this should be done.

Despite this, there remained mixed opinions on whether all nightlife venues should use PCG. Here, PCG were introduced in a range of venues, from nightclubs to wine bars and local pubs. However, some of these venues did continue to use standard glass, particularly for regular customers. Furthermore, we did not introduce PCG into venues such as restaurants and thus findings do not represent these types of venues. As Winder and Wesson (2006) argue, glass-related injury in nightlife premises occurs at peak times (e.g. after 11pm), mainly in particular bars and within specific areas of a bar (e.g. dance floor). They conclude that whilst PCG are effective in reducing glass-related injury, they may not be required in all circumstances. However, the quality of PCG has improved significantly over recent years, and as seen here, customers in some circumstances were not immediately aware that the vessel they were drinking out of was PCG. Thus, the argument for not rolling PCG out to all nightlife venues due to the perceived negative impact on the customers' drinking experience and subsequently venue trade becomes less apparent.

This study has highlighted a number of issues regarding the difficulties in measuring the impacts of nightlife-focused interventions such as the introduction of PCG. The nightlife industry can change rapidly making the consistent collection of data and compliance with interventions difficult. Here, eight venues shut down or changed managers and only fourteen completed all data throughout the course of the project. Furthermore, our study used a small selection of venues within three areas. With nightlife patrons typically moving between venues on a night out, it is likely that the customer survey participants visited both PCG and non-PCG venues within each study area. For future research, it would be useful to measure the impact of PCG by introducing them in all venues in a given area and comparing this to a similar area that does not use PCG.

7. Conclusion

This study has shown that the use of PCG in pubs, bars and nightclubs is broadly acceptable to both drinkers as well as managers and staff in licensed premises. Despite debate regarding the perceived impacts PCG can have on the drinking experience and venue trade, this study found no significant impacts on customer behaviour or perceptions of violence and safety in venues that adopted PCG. Critically, all venues introducing PCG as part of the study have voluntarily opted to continue using these drinking vessels after the trial period, given their observed cost and safety benefits and the lack of any negative impacts on trade. Further

research is needed into any potential adverse health and safety effects of PCG before wider implementation can be recommended. However, early findings suggest PCG can be a useful and acceptable tool in reducing glass-related injuries (both intentional and unintentional) in drinking environments. To date, use of PCG has predominantly been advocated for the prevention of serious injury in violence. However, interventions that address the tools of violence (here glassware) should be seen as just one part of a wider strategy that seeks to actually prevent violence and create safer nightlife environments.

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