O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:28 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM Springfield Liquor License Application

From: Todd Kadis [mailto:toddkadis@gmail.com]
Sent: Sunday, June 03, 2018 12:32 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

MA Gaming Commission,

Thank you for asking for comments on the proposal to allow MGM Springfield to serve liquor between 2:00 A.M. and 4:00 A.M..

If MGM Springfield is to be granted this additional free liquor serving period, I would ask that they be held financially accountable for their decisions related to serving free alcohol to their patrons, and the resulting actions of their patrons, upon leaving their Casino.

MGM Springfield could be required to establish a fund that would pay compensation to anyone that suffered a physical injury or property damage caused by a Casino patron, who was drinking free alcohol during this additional time period, and leaves their Casino. This fund would be separate from the Liquor Liability insurance that alcohol servers purchase. If payments from this fund exceeded a predetermined annual benchmark the Casino would surrender their license to serve free alcohol from 2:00 A.M. to 4:00 A.M..

Thank you again for allowing me to voice my opinion, and suggest a plan.

Todd Kadis
Longmeadow, MA

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:29 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM Springfield Liquor License Application

From: MJG MG [mailto:michael.j.gossman@gmail.com]
Sent: Sunday, June 03, 2018 3:45 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Subject: MGM Springfield Liquor License Application
While I do understand the 2-4 am restriction of "actively gaming guest". I see no definition of such. So there is no difference from a quarter slot player playing $1.00 per hour versus a $100 Poker player. Until that definition is determined I cannot support this additional two hour allowance.
Not to mention the violence that Springfield suffers from 130am to 230am after the closing of bars add your addition and that window would be extended 3 more hours.
I therefore want to submit a NO in your decision.

Michael Gossman
19 Upland Street
Springfield MA 01104
413-348-3679

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:30 PM
To: Blue, Catherine (MGC)
Subject: FW: Casino Alcohol

From: Keith Menard [mailto:kmenard@foxytravel.com]
Sent: Monday, June 04, 2018 9:53 AM
To: MGCcomments (MGC)
Subject: Casino Alcohol

If changing the drinking time to 4am is good for the Casino, then make it for ALL establishments that serve alcohol. If you aren't willing to change the law for everyone, then don't change it for anyone.

Thank you.

- Keith

Keith Menard
Foxy Travel, inc
FTI Coach
38 Providence Rd.
Linwood, MA 01525
508.234.4585

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:31 PM
To: Blue, Catherine (MGC)
Subject: FW: no drinking till 4:00 AM - then they have to get home and go to work?

From: JOSEPH PETERS [mailto:joep63@mac.com]
Sent: Monday, June 04, 2018 9:58 AM
To: MGCcomments (MGC)
Subject: no drinking till 4:00 AM - then they have to get home and go to work?

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:32 PM
To: Blue, Catherine (MGC)
Subject: FW: Extended drinking hours at Springfield Casino

-----Original Message-----
From: Frank Dellorfano [mailto:Frankjdell@aol.com]
Sent: Monday, June 04, 2018 10:01 AM
To: MGCcomments (MGC)
Subject: Extended drinking hours at Springfield Casino

NO EXTENDED DRINKING HOURS IN MASSACHUSETTS!

This would set a dangerous precedent. If Springfield Casino gets extended drinking hours you can bet (pun intended) the Everett Casino will demand (sue) for the same extension of drinking hours. Eventually every bar in Massachusetts will be serving drinks until 4:00 AM.

Frankjdell@aol.com

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:32 PM
To: Blue, Catherine (MGC)
Subject: FW: Late hours to sell alcohol

-----Original Message-----
From: Patricia D'Amore [mailto:pjeandamore@googlemail.com]
Sent: Monday, June 04, 2018 10:07 AM
To: MGCcomments (MGC)
Subject: Late hours to sell alcohol

I do not think the law should be changed/amended to allow the casino to sell alcohol until 4:00 AM.

Patricia D'Amore

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:33 PM
To: Blue, Catherine (MGC)
Subject: FW: Adding 2 hours to allow alcohol to be served

From: Kelly D Ferguson [mailto:capevette82@comcast.net]
Sent: Monday, June 04, 2018 10:18 AM
To: MGCcomments (MGC)
Subject: Adding 2 hours to allow alcohol to be served

This is a very bad idea period!! Who needs to be drinking until 4:00 in the morning? Please do not allow this flawed idea to become reality!

Be sensible and keep it the way it is - which is still to late to be serving alcohol!

Kelly Ferguson

Marstons Mills, MA

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:34 PM
To: Blue, Catherine (MGC)
Subject: FW: 2 AM is late enough

-----Original Message-----
From: George Frantz [mailto:frantzclan@comcast.net]
Sent: Monday, June 04, 2018 10:34 AM
To: MGCcomments (MGC)
Subject: 2 AM is late enough

I definitely suppo0rt the MGM Casino in Springfield. However, the 2 AM cutoff for serving alcohol is sufficient. Later serving will just increase the requirement for police activity and cost the city money.

Stick w/ 2 AM

George Frantz

Lancaster MA

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:35 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM liquor permit times

-----Original Message-----
From: Robert Conrad [mailto:crispybob@gmail.com]
Sent: Monday, June 04, 2018 10:39 AM
To: MGCcomments (MGC)
Subject: MGM liquor permit times

Absolutely not. Do not give MGM permission to sell liquor after 2:00 AM.
Respectfully
Robert Conrad

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:35 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM's request to serve liquor until 4 am

From: Mark J. Kesselman [mailto:mjk3@columbia.edu]
Sent: Monday, June 04, 2018 10:46 AM
To: MGCcomments (MGC)
Cc: Amrita Basu
Subject: Fwd: MGM's request to serve liquor until 4 am

---------- Forwarded message ----------
From: **Mark J. Kesselman** <mjk3@columbia.edu>
Date: Mon, Jun 4, 2018 at 10:44 AM
Subject: MGM's request to serve liquor until 4 am
To: +mgccomments@state.ma.us
Cc: Amrita Basu <abasu@amherst.edu>

We are residents of the Springfield area and are firmly--passionately--opposed to MGM's application to serve liquor until 4 am, i.e., beyond the usual 2 am limit. There is no question that some of those who drink until 4 am will be boisterous, rowdy, in brief, a threat to public order and safety. Even if the proportion of those in this category is small, it doesn't take more than one person drinking so late to disturb the neighborhood, one person driving while intoxicated to cause great harm to herself and others, etc. 2 am is already a very late hour. Why authorize serving alcohol until the wee hours of the morning?

Many thanks for your consideration of my appeal, which I make on behalf of myself, my children, neighbors, and the entire community,

Mark Kesselman
1364 Southeast Street
Amherst, MA 01002

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:36 PM
To: Blue, Catherine (MGC)
Subject: FW: Casino drinking extension

-----Original Message-----
From: Janice Hill [mailto:grandjan44@me.com]
Sent: Monday, June 04, 2018 10:55 AM
To: MGCcomments (MGC)
Subject: Casino drinking extension

This cannot be approved! Enough is enough. Jan Hill

Sent from my iPhone

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:37 PM
To: Blue, Catherine (MGC)
Subject: FW: Extended hours to serve alcohol at MGM Springfield

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From: Dana Dansereau [mailto:DanaDansereau@mcsnet.org]
Sent: Monday, June 04, 2018 10:56 AM
To: MGCcomments (MGC)
Subject: Extended hours to serve alcohol at MGM Springfield

I just wanted to voice my opposition to extending the hours until 4:00am to serve alcohol at MGM Springfield *to patrons who are actively gaming.* People primarily go to casinos to gamble, not to drink alcohol. To me, this appears to be a blatant attempt to take (further) advantage of people who are gambling while being under the influence and perhaps not having full command of their senses and intellect.

Dana Dansereau
Westfiled, MA

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:39 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM Springfield Liquor License Application

From: Ludmilla Pavlova [mailto:ludmillapavlova3@gmail.com]
Sent: Monday, June 04, 2018 11:09 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

I do not believe it is safe or appropriate to extend liquor sales at MGM casinos until 4am. This is likely to result in extending nightly disruptions to urban dwellers and increase the likelihood of driving fatalities and addictive behavior.

Ludmilla Pavlova-Gillham
Amherst, MA

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:39 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM Springfield Request to servce alcohol until 4pm

From: Chris Tecca [mailto:chris.tecca@gmail.com]
Sent: Monday, June 04, 2018 11:23 AM
To: MGCcomments (MGC)
Subject: Fwd: MGM Springfield Request to servce alcohol until 4pm

I would like to let you know that I am against allowing the state in giving the MGM grand permission to allow alchol to be served two hours after the current law of the Commonwealth.

If they really think it will impact revenues, then they should offer an increased state share of revenue for those two hours.

Best,
Chris

Chris Tecca

(e): chris.tecca@gmail.com
(m): 781-570-6249

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:39 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM Springfield Request to servce alcohol until 4pm

From: Chris Tecca [mailto:chris.tecca@gmail.com]
Sent: Monday, June 04, 2018 11:23 AM
To: MGCcomments (MGC)
Subject: Fwd: MGM Springfield Request to servce alcohol until 4pm

I would like to let you know that I am against allowing the state in giving the MGM grand permission to allow alchol to be served two hours after the current law of the Commonwealth.

If they really think it will impact revenues, then they should offer an increased state share of revenue for those two hours.

Best,
Chris

Chris Tecca

(e): chris.tecca@gmail.com
(m): 781-570-6249

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:40 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM Springfield Casino request to serve liquor/alcohol until 4:00 am

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From: Maguire, Mary D [mailto:Mary.Maguire@tufts.edu]
Sent: Monday, June 04, 2018 11:32 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Casino request to serve liquor/alcohol until 4:00 am

The casino owners were well aware of Massachusetts regulations when they decided to pursue a business in the Commonwealth of Massachusetts.
Please do not approve this special request. If you do approve it, how can you deny any other Massachusetts bar/club the right to serve alcohol until 4:00 am? It's a slippery slope.

Respectfully,
Mary Maguire
12 Prairie Schooner Trail
Brookfield, MA 01506

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:40 PM
To: Blue, Catherine (MGC)
Subject: FW: NO REASON TO EXTEND DRINKING HOURS

From: MJ [mailto:mjk@dabbelt.com]
Sent: Monday, June 04, 2018 11:41 AM
To: MGCcomments (MGC)
Subject: Re: NO REASON TO EXTEND DRINKING HOURS

On Mon, Jun 4, 2018, 11:35 AM MJ <dabbedy@comcast.net> wrote:

> Please note I am against extending any bar closure hours. By 2:00 am - you should have enjoyed the night enough.

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:41 PM
To: Blue, Catherine (MGC)
Subject: FW: MGM Springfield Casino

From: Keusch, Gerald T [mailto:keusch@bu.edu]
Sent: Monday, June 04, 2018 11:58 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Casino

I am a resident of Charlestown MA.

I wholeheartedly oppose any change in the hours for serving and purchase of alcoholic beverages at the Springfield MGM Casino. This is an even more aggregious request by MGM because the target for this beyond legal hours access to alcohol is patrons who are gambling at the Casino. It is precisely that constituency that can least afford any additional intoxication from alcohol while spending money to lose even more money at the venue as MGM racks up additional profits. Do not approve this request – it is outrageous.

Gerald T. Keusch, M.D.
Professor of Medicine and International Health
Boston University School of Medicine

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:41 PM
To: Blue, Catherine (MGC)
Subject: FW: Serving alcohol in casinos until 4 a.m.

From: Mary Livingston [mailto:mlivingston56@gmail.com]
Sent: Monday, June 04, 2018 12:09 PM
To: MGCcomments (MGC)
Subject: Serving alcohol in casinos until 4 a.m.

Please, please no!! Inebriated, exhausted people heading out in their cars close to the same time many commuters/contractors are heading to work?? In winter with added hazards of dark, snow and ice?? Very bad idea!!

Mary Livingston
Groton, MA

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:42 PM
To: Blue, Catherine (MGC)
Subject: FW: Extending serving alcohol from 2am to 4am in Springfield

-----Original Message-----
From: Wall-E [mailto:walleee3@me.com]
Sent: Monday, June 04, 2018 12:12 PM
To: MGCcomments (MGC)
Subject: Extending serving alcohol from 2am to 4am in Springfield

Absolutely!

But why go through the Faux "careful consideration" of the ramifications because if you did the casino wouldn't be there in the first place.

In a year or two the hours will be extended to 6am as we inch towards 24/7

but of course with the admonition to do so responsibly

... as in ... who's responsible for the check

Wall-E

O'Connor, Kim (MGC)

From: MGCcomments (MGC)
Sent: Monday, June 04, 2018 12:42 PM
To: Blue, Catherine (MGC)
Subject: FW: Booze until 4 a.m

From: Ron Blanchette [mailto:golfalot55@msn.com]
Sent: Monday, June 04, 2018 12:26 PM
To: MGCcomments (MGC)
Subject: Booze until 4 a.m

Don't approve it please

Ron Blanchette

O'Connor, Kim (MGC)

From: Bedrosian Jr., Edward (MGC)
Sent: Tuesday, June 05, 2018 7:40 AM
To: MGCcomments (MGC)
Subject: FW: Additional Time for Public Comment

Follow Up Flag: Follow up
Flag Status: Flagged

-----Original Message-----
From: Fenton, Michael A. [mailto:mfenton@springfieldcityhall.com]
Sent: Monday, June 4, 2018 7:18 PM
To: Bedrosian Jr., Edward (MGC) <Edward.Bedrosian@MassMail.State.MA.US>
Cc: Stratton, Seth <SStratton@mgmspringfield.com>; Ziemba, John S (MGC) <John.S.Ziemba@MassMail.State.MA.US>
Subject: RE: Additional Time for Public Comment

Members of the Massachusetts Gaming Commission --

Earlier this evening the Casino Oversight Committee of the Springfield City Council met and received testimony from MGM Springfield and the public concerning its application for alcohol service on the gaming floor between 2am-4am. Having received this testimony and visited the site with MGM and Mr. Bedrosian to inspect the locations where alcohol is proposed to be served between the hours of 2am-4am, I am supportive of MGM's above described application. In light of the controls that will be put in place and the limited scope of the proposed alcohol service, it is my opinion that allowing MGM to serve alcohol as described in its application would be a benefit to the regional economy and the casino. Earlier this evening, my committee voted unamiously to support MGM Springfield's pending applicaiton before your commission which includes the request to serve alcohol to active gamers between 2am-4am. We respectfully request that you conduct a swift hearing on this matter and approve the application.

Please feel free to contact me with any questions or concerns.

Sincerely,

Michael A. Fenton
Springfield City Council
Chair, Casino Oversight Commitee
413-523-3223

From: Bedrosian, Edward (MGC) [edward.bedrosian@state.ma.us]
Sent: Monday, June 04, 2018 12:56 PM
To: Fenton, Michael A.
Cc: Stratton, Seth; Ziemba, John S (MGC)
Subject: Additional Time for Public Comment

Councilor Fenton-

From our meeting in Springfield last week, I understand you would like some additional time for the Committee you chair, the Casino Oversight Committee of the Springfield City Council, to consider the issue of alcohol service at MGM Springfield past 2 AM until 4 AM. I also understand this issue may be addressed at a meeting this evening.

Please feel free to submit your comments after your meeting and please copy me on them.

If you have any other questions or concerns, also feel free to contact me.

Ed Bedrosian

Edward R. Bedrosian Jr.
Executive Director
Massachusetts Gaming Commission
101 Federal Street, 12th Floor
Boston, Ma. 02110
Tel: 617-979-8435

www.massgaming.com<https://urldefense.proofpoint.com/v2/url?u=http-3A__www.massgaming.com_&d=DwIFAg&c=lDF7oMaPKXpkYvev9V-fVahWL0QWnGCCAfCDz1Bns_w&r=8pnsPIU4JXzeFyjSvn2CveUkhEjf50TL5dR1DZ4XPp8&m=2xhragQfiValDNyrWyRo3MpwNr5baQz0gf9fT7iNnsM&s=bClnZGnKPFGqeWJoCFkT53RapRF-3L2ebJrTK7v8R0c&e=>

O'Connor, Kim (MGC)

From: Thomas Murphy <tpmurphbars@gmail.com>
Sent: Monday, June 04, 2018 3:47 PM
To: MGCcomments (MGC)
Subject: "MGM Springfield Liquor License Application"

To whom it may concern;

I was never opposed to MGM coming to Springfield, even though a casino holds a distinct advantage over a regular food and beverage operation. I assumed my business would take a hit upon it's opening because it was the "new shiny object", but after a few months things would go back to normal.

However, if you approve MGM the ability to serve to 4 am and not conform to current MA happy hour regulations, it will be a crushing blow to bars and restaurants in MA. At it's face, it is discriminatory. You are allowing one large outside entity a further competitive advantage over other small businesses in the region. Let me give you examples of why I believe this. I own and operate a small pub in Agawam.

Free alcohol will drive guests from local bars/restaurants that must charge - on a good Saturday afternoon I have 26 guests ordering food and drinks and playing Keno from the MA Lottery. If those same guests can go to MGM and enjoy free drinks and discounted food while gambling, where do you think they will go? That will be a big loss to my business.

4 am close will drive guests to by pass visiting local establishments - My business stays open until 2 am. Our busy time ends around 11 but we do get a younger crowd that comes in after 11 as many are just coming out. If these folks can go to the gaming floor at MGM (and what is the definition of gaming floor?) and stay to 4 am, they will go directly there and bypass my establishment causing further losses. And, what is to stop MGM from opening a club and putting games in the club and calling it a gaming floor?

Drunk Driving and Crime - the #1 complaint in opposition to this casino was crime. Now, you are going to open the flood gates. At last call, people will flood to the casino. Not all will get in. Drunks will pour into Springfield and you will have people walking the streets. Crime will increase and so will drunk driving. Now, when 4 am comes around these folks will be driving drunk (drunker than they were previously) back into the surrounding towns.

To allow MGM this competitive advantage would be a huge dis-service to the bars and restaurants in the region. What's worse, many operators are not even aware of what's coming. My understanding is this was a last minute addition by the legislature into the budget. MGM came to Springfield saying they wanted to be a good partner. Looking for special advantages that directly compete against local business is not what I call a good partnership. They knew what the law was before they committed. I understand the argument for this is to be more competitive with the Casinos in CT. They all follow CT state law and close at 1 am or 2 am depending on the day. This is unnecessary. Please do the right thing and vote this down and support local small businesses.

Sincerely,

Thomas Murphy
President
342, Inc

O'Connor, Kim (MGC)

From: Jeff Boisseau <jeff@7bsbarandgrill.com>
Sent: Monday, June 04, 2018 3:13 PM
To: MGCcomments (MGC)
Subject: Best of Luck

Follow Up Flag: Follow up
Flag Status: Flagged

I'll support this, I'm in full belief that nothing good happens after 2am so more power to you.

Chef Jeff

O'Connor, Kim (MGC)

From:	Joe Deng <joe.deng@limeredteahouse.com>
Sent:	Monday, June 04, 2018 5:00 PM
To:	MGCcomments (MGC)
Subject:	MGM Springfield Liquor License Application
Follow Up Flag:	Follow up
Flag Status:	Flagged

As a business owner in MA, I do not believe we should live by different standards and call that a free and fair country.

I agree with the MA Rest Association that this committee rejects special privileges to special interests.

Do not create separate rules so some can benefit while others are at a disadvantage. This is not what government and regulations should do.

We are pro business. We are not asking MGM to not have the ability as much as we should not make special exceptions to our laws: make admendments. Small business who can not afford fancy lawyers follow the law and those with the means, multi national corps, can make their own exceptions?

How can this state allow for this? Equal rights for all: please.

Joe Deng

PS: Maybe MGM could invest its funds to legalizing this for all of us instead of just themselves.

--

Regards,

Joe Deng
CEO/Founder - LimeRed Teahouse
joe.deng@limeredteahouse.com
646-919-0601

O'Connor, Kim (MGC)

From: Tim Rooke <trooke@axiagroup.net>
Sent: Monday, June 04, 2018 3:05 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application - In favor

Follow Up Flag: Follow up
Flag Status: Flagged

June 4, 2018

Attention: Attorney Catherine Blue, MGC General Counsel

Good afternoon Gaming Commissioner Cosby and other Members:

I am writing in full support of MGM Casino request for the extended hours to serve alcohol on the casino floor for "actively engaged in gaming" players from 2 am to 4 am.

As a small business owner whose Insurance Agency is located at 933 East Columbus Avenue, which is just outside the MGM Casino footprint. A parent of two children over 21, a lifelong resident of Springfield for 55 years and as a former elected official of Springfield for 20 years, I am in favor of the extended hours for individuals "actively engaged".

The gaming industry is extremely competitive and success is sometimes determined and driven by percentages. I feel confident allowing the extended hours. Along with adequate guidelines, processes and procedures established by the Massachusetts Gaming Commission and the Alcohol Beverage Control Commission. While we want to support MGM and their success. We also need to assure that the best interest of the public, it's health and welfare are also considered. The Massachusetts Gaming Commission may revoke, suspend, refuse to renew or refuse to transfer any approved license for violations of Chapter 138 which pertain to alcohol sales and distribution due to any violations.

We need to support responsible businesses. In all of my dealings with MGM I have found them to exercise sound judgement and best business practices on all decisions. I ask for your serious consideration and support on this request.

I am happy to offer verbal testimony if needed. Thank you for allowing public testimony on this issue.

Respectfully submitted,

Timothy Rooke, VP
Axia Insurance Services
933 East Columbus Avenue
Springfield, MA 01105

O'Connor, Kim (MGC)

From: Susan Nelson <susan.nelson315@gmail.com>
Sent: Monday, June 04, 2018 3:03 PM
To: MGCcomments (MGC)
Subject: Alcohol Law

Follow Up Flag: Follow up
Flag Status: Flagged

Absolutely do not allow drinking until 4am. It may be a revenue maker for a private business, but it is a disater for eveyone and everything else. We already have a problem with alcohol in this country. The last thing we need is to have more alcohol-induced drivers on the roads, just as school busses and commuters hit the roads.

BAD IDEA BY GREEDY IDIOTS!

Susan L. Nelson
Norfolk, MA

O'Connor, Kim (MGC)

From: Steve Clark <sclark@themassrest.org>
Sent: Monday, June 04, 2018 1:50 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application/4:00 AM service of alcohol
Attachments: MRA Letter to MGC- 4 AM alcohol service.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

To whom it may concern,-
Please find the attached letter to the Massachusetts Gaming Commission regarding the MGM Casino's application to serve alcohol until 4:00AM. This letter should double as testimony in opposition to any Casino entity in Massachusetts application to serve alcohol until 4:00AM.

Please do not hesitate to contact us if we can be of further assistance.

Thank you,

Stephen Clark
Director of Government Affairs
Massachusetts Restaurant Association
508-303-9905
508-573-4189 (direct dial)

O'Connor, Kim (MGC)

From: al stankus <imbettor@yahoo.com>
Sent: Monday, June 04, 2018 1:21 PM
To: MGCcomments (MGC)
Subject: Fw: 4 am for casino

Follow Up Flag: Follow up
Flag Status: Flagged

Sent from Yahoo Mail on Android

On Mon, Jun 4, 2018 at 1:17 PM, al stankus <imbettor@yahoo.com> wrote:

I am in favor of granting the casino and all casinos 4.a.m. licenses.

In fact, I think all licenses should come with a 4 a.m license.

it makes sense in 2018

al stankus

Sent from Yahoo 44Mail on Android
Sent from Yahoo Mail on Android

O'Connor, Kim (MGC)

From: Priscilla B. <prsbro@aol.com>
Sent: Monday, June 04, 2018 2:51 PM
To: MGCcomments (MGC)
Subject: Please- Do NOT Allow the Extension of Making Liquor Available Unitl 4am to Gambiling Individuals

Follow Up Flag: Follow up
Flag Status: Flagged

I am very very opposed to this new liquor law being put into effect at the casinos. It is not only unnecessary, but also foolhardy and extremely dangerous to have people gambling and drinking until 4am in the morning.

Utterly irresponsible and a huge safety hazard and threat to our society and to these individuals who may be feeding one addiction -gambling- to their detriment and demise, but also the addiction of substance use and abuse.

Please do the right thing and hold fast to the 2am closing time for alcohol.

A concerned voter and Massachusetts resident and Registered Nurse.

O'Connor, Kim (MGC)

From: Elizabeth H Jenkins <bethjen@hotmail.com>
Sent: Friday, June 01, 2018 2:47 PM
To: MGCcomments (MGC)
Subject: License Application

To whom it may concern:

I am absolutely opposed to MGM or any establishment within Springfield being allowed to serve alcohol until 4 am on any day of the week. I am also very opposed to MGM's idea of using plastic cups. This globe does not need any further plastic trash. I live in Springfield and we already have enough problems with bars open until 2 am.
All MGM wants is for their gambling customers to become so inebriated that they will make more money for the Casino.

As a recovering alcoholic I have seen way too much caused by the overuse of alcohol to endorse this idea at all. I have been sober almost 34 years and it is hard enough for me to navigate the city streets on foot, with my walker, during daylight hours without encountering someone who is stupidly drunk.

Respectfully,

Elizabeth H Jenkins
307 Chestnut Street, Apt. 614
Springfield, MA. 01104

Sent from my iPad

Regarding MGM Springfield

Drinking Age 21+ should be restricted to Hotel Key Owners.

Gaurav Agarwal
MA

Please do not 'extend last call' for any reason in the casino for gamblers or other patrons.

F.E. Leaberne - Cinick

O'Connor, Kim (MGC)

From: Matthew Dovell <mdovell@comcast.net>
Sent: Wednesday, May 30, 2018 4:34 PM
To: MGCcomments (MGC)
Subject: Liquor License Application

Categories: Green Category

Dear Mass Gaming Commission,

These words are my own and do not represent any of my current, former or future employers. I am a resident of the City of Springfield and live right down the street from MGM at 45 Willow Street. Having moved here about three and a half years ago I understand the gravity of what the project means to the City of Springfield, the region and Commonwealth of Massachusetts as a whole. I wish to say that I am for this, however that there should be some attention by the state to see what the countermeasures might be in CT. CT still has "Happy hour" and if they extend those hours it could create complications. MGM like any other entity with a liquor license must serve responsibly and cut those off that appear to be intoxicated. Those that might argue that it would encourage more drinking might also notice the number of liquor stores in the area and that the cost of liquor per drink at MGM would be much higher than from a store. If the argument is to lower the consumption of alcohol that goes well beyond the operations of a casino and looks more towards local liquor licenses and zoning. Thank you for your time.

Sincerely,

Matthew Dovell MPA

45 Willow St Apt 105

Springfield, Ma 01103

O'Connor, Kim (MGC)

From: cpasterczy@aol.com
Sent: Wednesday, May 30, 2018 9:09 AM
To: MGCcomments (MGC)
Subject: Fwd: mgm springfield liquor license

Categories: Green Category

I urge lawmakers to vote NO on serving liquor past the 2 AM deadline. Nothing good happens after 1 AM with this law. We are not Las Vegas, but a smaller city that has fewer means to control the drunks who may roam the streets that late/early morning.
Please, let's see how this casino operates in the first year before we grant any privileges!!!!!!!!!!!!!!!!!!!
Thank you Celeste

O'Connor, Kim (MGC)

From: Gary Ganoe <Garygg@charter.net>
Sent: Tuesday, May 29, 2018 7:11 PM
To: MGCcomments (MGC)
Subject: MGM License Application

Categories: Green Category

Sent from my iPad

Who whom it may concern:

I do NOT feel the 2:00 a.m. Drinking time should be extended, it will just lead to more impaired drivers on the road! The 2:00 a.m. time is late enough, and would be a great idea to only serve patrons who are actually registered to stay at the hotel.

Please help to keep our city and the streets safe.

Thank you in advance,

CGanoe

O'Connor, Kim (MGC)

From: Fenton, Michael A. <mfenton@springfieldcityhall.com>
Sent: Tuesday, May 29, 2018 11:13 PM
To: MGCcomments (MGC)
Cc: Frank P. Fitzgerald; Seth; jdelgado@mgmspringfield.com
Subject: MGM Springfield Liquor

Categories: Green Category

Members of the Gaming Commission:

Please accept this correspondence as my response to the request for public comment on MGM Springfield's application to serve alcohol until 4AM. I learned about this request through media reports, which was disappointing to me at the Chair of the Casino Oversight Committee of the Springfield City Council. During at least two public meetings held by my committee earlier this month, MGM Springfield was asked to share whether it would apply to the MGC for permission to serve alcohol past 2AM. MGM Springfield's testimony during these meetings was that no decision had been made by the company and that they would report back to the committee no later than June 15th on the matter. A meeting has been scheduled for June 15th to discuss several outstanding matters with MGM Springfield. Item number three on this agenda is to get an update from MGM regarding its intent with respect to alcohol service after 2AM. Given that the deadline to submit comments to the MGC on this matter is June 4th, and given that I have received no notice from MGM regarding this matter, I respectfully request that the MGC extend the comment period on this matter until June 18th. Until such time as my committee can be briefed on this matter and given an opportunity to provide meaningful feedback on behalf of the residents of Springfield, I am opposed to allowing alcohol service at MGM Springfield past 2AM.

Thank you,

Michael A. Fenton
Springfield City Councilor
413-523-3223

O'Connor, Kim (MGC)

From: cpasterczy@aol.com
Sent: Wednesday, May 30, 2018 9:09 AM
To: MGCcomments (MGC)
Subject: Fwd: mgm springfield liquor license application

Categories: Green Category

I urge lawmakers to vote NO on serving liquor past the 2 AM deadline. Nothing good happens after 1 AM with this law. We are not Las Vegas, but a smaller city that has fewer means to control the drunks who may roam the streets that late/early morning.
Please, let's see how this casino operates in the first year before we grant any privileges!!!!!!!!!!!!!!!!!!!
Thank you Celeste

O'Connor, Kim (MGC)

From: suzanne boniface <suzannemboniface@icloud.com>
Sent: Friday, May 25, 2018 9:29 AM
To: MGCcomments (MGC)
Subject: "MGM Springfield Li

Categories: Green Categor

5/29 comments.

As a resident of the City of Springfield, I am strong until 4 am. I believe this is a dangerous move to make for the safety of

Thank you.

Suzanne Boniface.

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: susan dion <sue1952us@yahoo.com>
Sent: Friday, May 25, 2018 6:52 AM
To: MGCcomments (MGC)
Subject: "MGM Springfield Liquor License Application"

Categories: Green Category

Dear State Gaming Commission:
I am not in favor of extending the serving of alcohol beyond the state restriction of 2 am. at the new MGM casino in Springfield. I believe this exception could lead to even more problems than addictive gambling that is going to take place here in Springfield. The family life, safety and well-being of the people of Springfield and surrounding communities is at stake here. People who are already in a frenzied state of gambling into the early hours of the morning should not be plied with alcohol which will only distort their judgement more. These same individuals do not need to be out on the roads, endangering others after a night of drinking and gambling. We already have enough distracted driving in this state.
MGM has some guidelines in place for addictive gambling, but they are weak because MGM has no motivation to have people gamble less. Gamblers Anonymous, which promotes abstention from addictive gambling, is not even mentioned on their website. Gamesense is only a voluntary program and will not adequately restrain those with issues. My firm belief is alcohol and gambling are a poor mix and the state law of no drinks served beyond 2 am should stand.
Let's keep this community and those near it safe.
Sincerely,
Susan J. Dion
51 Eskett Road
Belchertown, MA 01007
413.323.5517

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: Mary Keough <mekbennington@gmail.com>
Sent: Friday, May 25, 2018 6:17 PM
To: MGCcomments (MGC)
Subject: "MGM Springfield Liquor License Application"

Follow Up Flag: Follow up
Flag Status: Flagged

To Whom It May Concern:

I am a resident of the City of Springfield and I would like to add my support to the increased hours of alcohol service at MGM between the hours of 2 am and 4 am for
active gamblers only. I feel if MGM wants to compete with Mohegan Sun and Foxwoods increased hours are warranted.

Since this project is years behind, we should give it our best shot. If there is a lot of push back about this subject, perhaps make this a temporary service to see if problems arise.

Mary Keough
40 Bennington Street
Springfield, MA 01108

O'Connor, Kim (MGC)

From: Mark Gedmin <livin2cruise@icloud.com>
Sent: Thursday, May 24, 2018 4:37 PM
To: MGCcomments (MGC)
Subject: 4am liquor

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Green Category

I see no problem with this as long as the people being served are sober.

Sent from my iPhone

Forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: susan dion <sue1952us@yahoo.com>
Sent: Friday, May 25, 2018 6:40 AM
To: MGCcomments (MGC)
Subject: Alcohol Serving after 2am.

Categories: Green Category

Dear State Gaming Commission:
I am not in favor of extending the serving of alcohol beyond the state restriction of 2 am. at the new MGM casino in Springfield. I believe this exception could lead to even more problems than addictive gambling that is going to take place here in Springfield. The family life, safety and well-being of the people of Springfield and surrounding communities as at stake here. People who are already in a frenzied state of gambling into the early hours of the morning should not be plied with alcohol which will only distort their judgement more. These same individuals do not need to be out on the roads, endangering others after a night of drinking and gambling. We already have enough distracted driving in this state.
MGM has some guidelines in place for addictive gambling, but they are weak because MGM has not motivation to have people gamble less. Gamblers Anonymous, which promotes abstention from addictive gambling is not even mentioned on their website. Gamesense is only a voluntary program and will not adequately restrain those with issues. My firm belief is alcohol and gambling are a poor mix and the state law of no drinks served beyond 2 am should stand.
Let's keep this community and those near it safe.
Sincerely,
Susan J. Dion
51 Eskett Road
Belchertown, MA 01007
413.323.5517

SG forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: MGC Website <massgamingcomm@gmail.com>
Sent: Friday, May 25, 2018 5:41 AM
To: MGCcomments (MGC)
Subject: Contact the Commissioner Form Submission

Categories: Green Category

Name

Nicole Geoffrion

Email

Nicole.Geoffrion@gmail.com

Phone

(413) 579-2035

Subject

MGM Extended Alcohol Hours

Questions or Comments

As a Springfield resident, I want to share my support of MGM Springfields extended hours from 2 to 4 a.m. on the gaming floor.

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: MGC Website <massgamingcomm@gmail.com>
Sent: Saturday, May 26, 2018 1:05 PM
To: MGCcomments (MGC)
Subject: Contact the Commissioner Form Submission

Follow Up Flag: Follow up
Flag Status: Completed

Name

melissa holman

Email

holmanspfld@aol.com

Phone

(413) 747-9918

Subject

extending alcohal serving hours to 4:00 A.M.

Questions or Comments

Our bars stop serving at 2 A.M. --I don't think it's a good idea to continue serving at the MGM Casino after 2 A.M. I worry about accidents on the highway and local streets. A bad scene for commuters coming in to the city to work.

O'Connor, Kim (MGC)

From: Ashley Vassallo <ashleyvassallo@yahoo.com>
Sent: Tuesday, May 29, 2018 11:01 AM
To: MGCcomments (MGC)
Subject: MGM liquor license

To whom it may concern,

The MGM Springfield professionalism and security will be able to properly monitor the consumption of alcohol after 2am. We all know the risk of drinking and driving. My community will be safer by having an establishment that will allow inebriated people to stay and be monitored versus a bar that will close and tell them to go home.

Thank you for your consideration,
Ashley P. Vassallo
Monson, MA

Sent from my iPhone

O'Connor, Kim (MGC)

From: Joseph Mruk <profjmcm@gmail.com>
Sent: Sunday, May 27, 2018 4:57 PM
To: MGCcomments (MGC)
Subject: MGM liquor license request

Follow Up Flag: Follow up
Flag Status: Completed

Ridiculous idea. The existing law is meant for all, no exceptions.

O'Connor, Kim (MGC)

From: Clint Richmond <crbrookline@aol.com>
Sent: Friday, May 25, 2018 11:07 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Beverage License - Extended Hours

Categories: Green Category

I am not in favor of extending alcohol service beyond 2 AM anywhere in Massachusetts. Combining gambling and drinking past 2 AM is an incredibly stupid idea for MGM's patrons and the community and will only lead to trouble.

Clint Richmond,
Brookline, MA

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: DANIEL CHAMBERLAIN <danielchamberlain@msn.com>
Sent: Sunday, May 27, 2018 7:46 PM
To: MGCcomments (MGC)
Subject: Mgm Springfield expanded booze hours

Follow Up Flag: Follow up
Flag Status: Completed

Let's these guys run their business and be successful for Springfield's sake.

Sent from my iPad

O'Connor, Kim (MGC)

From: niksam28@aol.com
Sent: Friday, May 25, 2018 4:26 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License

Categories: Green Category

To whom it may concern,
My thoughts on the serving of alcohol between the hours of 2-4am initially was a rousing no. In thinking a bit, there is a huge number of second shifters in this area alone that get out somewhere in area of 11:30pm and midnight. These people would like a chance to socialize a bit as the rest of the population. a lot of people work this shift out of necessity for child care and truly would appreciate the chance for a social life.
The only condition is one must absolutely make sure that all the rules are being adhered to. The servers need to know they have the backing to say no to customers that have already been served elsewhere and would put everyone at risk. They need to know that absolutely need to follow the rules in serving customers that come in for free drinks.
To me, the "free" drinks part is a problem. I have watched in Plainridge where free is now $4 for a beer. The amount of alcohol going out is not going to be the same when one is paying for it. I have seen over and over at Foxwoods and Mohegan where it seems one person is playing and all of the buddies line up for their drinks as they sit at machines and that seems to entitle them. This is a lose lose proposition. The machines are being tied up and they drinks are going to people not really patronizing the establishment. I also notice they drink higher end product. I see a lot of Pina Colada's going out where they would not ever order these if they are paying for them. It does make me slightly nuts as it is putting these places at risk with the servers not being as alert as they should be. They, the server, really need to be educated and understand they are at risk legally for serving when they should not.
I actually had a liquor license and had to be so diligent with the bartenders who wanted to over serve and serve later as their customer was a great customer. My battle cry was always that these great customers would be the first to sue with the server liable for what ever happened as a result of their negligent serving. Supervision is key.
These are my thoughts.
Joanne Griffin

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: DAVID TORRE <djsuperdave@comcast.net>
Sent: Saturday, May 26, 2018 2:41 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Follow Up Flag: Follow up
Flag Status: Completed

My opinion on extended hours for serving alcohol is this: State law is 2:00am and that will most likely stand, HOWEVER, I would be ok with serving patrons that are actually staying in an on-site hotel (if they can prove it).

O'Connor, Kim (MGC)

From: John Jurkowski <midas-777@hotmail.com>
Sent: Saturday, May 26, 2018 8:07 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Follow Up Flag: Follow up
Flag Status: Completed

The state should NOT allow alcohol to be served at all in casinos. It is NOT a good idea to serve alcohol at ANY location where people will have their judgement clouded by alcohol when wagering money. Casinos know that plying patrons with alcohol will cause them to lose more money than if not drinking.
There is also the safety issue - more inebriated drivers let loose on the roads to kill innocent victims.
For the welfare of the public - make all casinos in the state alcohol-free.

John Jurkowski
Wilbraham, MA

O'Connor, Kim (MGC)

From: Matthew Harrington <mattharrington1@gmail.com>
Sent: Friday, May 25, 2018 8:02 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Follow Up Flag: Follow up
Flag Status: Completed

To the Gaming Commission,

Please permit MGM Springfield to serve alcohol until 4:00am. This will allow it to be competitive with other regional casinos.

Thanks in advance,

Matt Harrington

O'Connor, Kim (MGC)

From: Angela Negron <bostonator7413@gmail.com>
Sent: Friday, May 25, 2018 11:55 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

I think you should serve alcohol until 4AM

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: Ted <tted117@comcast.net>
Sent: Friday, May 25, 2018 11:41 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

Honorable Commissioners,

Please do NOT grant a special extension to the MGM Springfield's liquor license.

First, as a resident who lives within a few miles of the new facility, I am very concerned that extended alcohol service will increase the likelihood that intoxicated casino patrons will take to the streets during the morning commute and impact public safety.

Second, there is no compelling interest in serving liquor past the long established 2AM cutoff other than making people too insensible to stop gambling when they probably should take a break and rest. Extended alcohol service does not benefit the patrons of the casino nor the local residents.

Third, granting this special exemption would create pressure on other local adult-themed businesses to lobby for similar treatment, given the precedent of the casino exemption, further increasing the risk to our community. (You have only to look at the history of Sunday liquor sales in MA to see how an exception can become a rule in short order.)

I believe that our community has accommodated this business' needs very generously so far in the interest of public-private partnership. In this request they have overreached into an area where we should not compromise.

Thank you for your kind attention.

Very respectfully,

Edward J Sweeney
Longmeadow MA

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: Adam Moreau <adamwm629@gmail.com>
Sent: Friday, May 25, 2018 11:11 AM
To: MGCcomments (MGC)
Subject: MGM springfield liquor license application

Categories: Green Category

I would like to express my strong opposition to extending hours for serving alcohol for MGM until 4am. Primarily, my objection is that it would provide a significant competitive disadvantage to bars and taverns in the area which will already likely be negatively impacted by having an inner city casino for competition.

Second, there is a real public safety concern as patrons drinking that late will then be closer to getting on the roads during the morning commute when there is far more traffic in the area.

Thank you.

Adam Moreau
26 Old Reed Road
Monson, MA 01057

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: kathleen plante <kmpmessages@gmail.com>
Sent: Friday, May 25, 2018 7:52 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

Re extended drinking hours within the casino.

No matter which casino I spend time in, I would expect to be able to have a drink whenever the casino was open. I would expect nothing different at MGM Springfield.

Consequently, they should be able to serve alcohol during the hours that are now in question.

Thank you for the work you're doing for the citizens of Massachusetts.

--
Best, Kathleen

SG forwaded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: Annie5379 <annie5379@yahoo.com>
Sent: Friday, May 25, 2018 7:47 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

Please do not extend the hours to serve alcohol at the new Springfield Ma casino.

I realize that alcohol will only be served to those actively gaming, but who will make that determination?

2 AM is definitely a reasonable cut off time to serve alcohol.

Thank you

Ann LaBonte
187 Theroux Dr Apt D
Chicopee Ma 01020

SG forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: Yesenia Rivera-Caraballo <jesscara1987@gmail.com>
Sent: Friday, May 25, 2018 7:32 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

Good morning,
I am writing to share my opinion about the MGM Springfield Liquor License. I believe that they should be permitted to serve alcohol past the current 2 am deadline that has been set for other bars and clubs in the city. The casino will not generate the kind of revenue it will need to if it is not allowed to operate the way other Casino's do. We must consider that having the casino here in Springfield will attract visitors from outside of MA, and we must be able to meet their expectations by providing the same experience they would have at other casinos. With the metro police division in place in addition to MGM's expert experience in the entertainment business, we should not have the problems some of Springfield's residents are so worried about. However, if we are to deny MGM the liquor License they are requesting we would be doing so to our own detriment. This is new to everyone here in Springfield, and I understand where the concern is coming from. However, we must remain flexible and open minded because soon we will see Springfield's renaissance. We shouldn't risk the operational failure of this casino because people are worried about the unknown.

Sincerely,
Yesenia Gorham
Springfield, MA 01107
413-686-4423

SG forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: adam@advertusmedia.com
Sent: Friday, May 25, 2018 7:17 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

Good Morning

I would like to express my strong opposition to extending hours of serving alcohol for MGM until 4am.

Primarily, my objection is that it would provide a significant competitive disadvantage to bars and taverns in the area which will already likely be negatively impacted by having an inner city casino for competition.

Second, there is a real public safety concern that patrons drinking that late will then be closer to getting on the roads during the morning commute when there is far more traffic in the area.

PLEASE, do not let this happen.

Best Regards,

Adam

Adam Wright
Advertus Media
(413) 564-5200

SG forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: Deja Cradle <princessday629@gmail.com>
Sent: Friday, May 25, 2018 4:34 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

Hello my name is Deja cradle and I live in Springfield. I feel like the liquor hours should be extended due to the traffic that we are expecting to have in Springfield. As someone who visits Las Vegas,Nevada often, it would make sense to extend hours past 2am and also allow other stores to sell liquor as well

Sent from my iPhone

SG forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: Tyler Kenefick, Esq. <tyler.j.kenefick@gmail.com>
Sent: Thursday, May 24, 2018 11:00 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

I support a later last call for mgm. All establishments should be able to sell alcohol until 4 am

Sent from my iPhone

SG forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: JOHN LYFORD <bingville@comcast.net>
Sent: Thursday, May 24, 2018 10:46 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

To Whom It May Concern,

My name is John Lyford, I am a homeowner in Greenfield. I rise in support of MGM to extend the hours to serve alcohol to 4 a.m. I am a decades long customer of MGM Resorts International in Las Vegas. I am a decades long gambler. Frequently in Las Vegas I gamble in the early morning hours. I enjoy to have a cocktail during this time. In my experience at MGM properties in Las Vegas, I find MGM a responsible company to oversee the customers in the early morning hours serving alcohol. A few times, I have seen MGM shut off customers who look intoxicated. I do know the bartenders and servers on the casino floor go through training to observe customers actions.

As a long time MGM customer, I will patronize MGM Springfield. I am sure when I stay at the MGM Springfield hotel, I will look forward to gamble in the early morning time frame, and I also look forward to have a cocktail during this period. I ask the Gaming Commission to support MGM Resorts International intention to extend the hours serving alcohol at MGM Springfield. I thank you for your attention in this matter. John Lyford

SG Forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: Patrick Roach <Patrick_Roach@hotmail.com>
Sent: Thursday, May 24, 2018 4:44 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

Commissioners,

Please know that I strongly support MGM's application for alcohol service on the gaming floor between 2am - 4am. We are very excited for MGM in Springfield and their positive impact on the economy and community.

Thank you,
Patrick Roach
Wilbraham, MA

Fowarded to Catherine B 5/25/18 SG

O'Connor, Kim (MGC)

From: Jason Levine <jlevine@murphymccoubrey.com>
Sent: Thursday, May 24, 2018 4:01 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Categories: Green Category

Of course the casinos should be allowed to serve alcohol on the gaming floor until 4 AM.

The whole idea of these casinos was to attract more money into the Commonwealth by making it an even more attractive place for conventions/vacations/etc. In order to make these casinos competitive with other states seeking to do the same via casinos, the casinos have to be allowed to be competitive with them. Nevada and Atlantic City are 24 hour alcohol locales, both on and off the casino floor. New York casinos serve until 4 AM. The casinos in CT are pushing for later hours. If we have decided that casinos are a route to increased revenues for the municipalities and the Commonwealth, we should not tie their hands to make themselves a less attractive option compared to other casinos. Allowing alcohol service to those actively gaming until 4 AM is part of that.

Thank you,

Jason L. Levine, Esq.
Murphy McCoubrey
272 Exchange Street
Chicopee, MA 01014
ph: 413.592.6106
fax:413.594.7409
jlevine@murphymccoubrey.com
Admitted to practice in Massachusetts and New York

Forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: Elizabeth Mruk <treasuresfromliz@gmail.com>
Sent: Sunday, May 27, 2018 8:34 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License Application

Follow Up Flag: Follow up
Flag Status: Completed

I am writing to state my OPPOSITION to serving alcohol beyond legally established hours of 2:00 a.m. at the MGM
Casino.

According to state law, absolutely no liquor is to be served between the hours of 2:00 a.m. and 8:00 a.m. If an exception is made, the law is moot, and all establishments serving alcohol should be allowed the same exemption.

Don't let big business exchange our values for their monetary gain.

O'Connor, Kim (MGC)

From: Sandie <scorker@verizon.net>
Sent: Friday, May 25, 2018 7:04 AM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor License

Categories: Green Category

I am in favor of allowing MGM Springfield to extend their hours of serving alcohol to those actively gambling. By not including individuals simply walking around the casino looking for a drink after other establishments have closed, it will protect local bars from losing customers while allowing MGM to remain competitive with gaming facilities in bordering states. It would be particularly important if MGM is able to attract universally recognized poker tournaments which could bring in added revenue.

Sent from my iPad

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: Stanley Kaleta <oceanbreeze1@charter.net>
Sent: Thursday, May 24, 2018 5:27 PM
To: MGCcomments (MGC)
Subject: MGM Springfield Liquor Liscense Application

Categories: Green Category

If controlled as mentioned on Mass Live I think it will be a great idea !!

Sent from Mail for Windows 10

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: Kent tarrant <kent100@charter.net>
Sent: Sunday, May 27, 2018 3:10 AM
To: MGCcomments (MGC)
Subject: MGM Springfield liquor listens application

Follow Up Flag: Follow up
Flag Status: Completed

It is hard to imagine a scenario where anyone drinking at that hour has not consumed more than the legal limit to operate a motor vehicle or be of sound mind. The discretion of the server to determine whether someone has had enough is unreliable. No doubt there will be unhappy endings and innocent lives lost if this application is approved. Liquor being served at this hour is unnecessary and dangerous. MGM Springfield's impact on the city is yet to be determined. Erring on the side of caution and good common sense in these unpredictable early stages of Springfield's new era is prudent for those given authority. Go slow....vote no.
Kent Tarrant, Hampden, MA
Sent from my iPad

O'Connor, Kim (MGC)

From: m.gilsinger <m.gilsinger@comcast.net>
Sent: Friday, May 25, 2018 7:04 AM
To: MGCcomments (MGC)
Subject: my opinion MGM alcohol regs

Categories: Green Category

MGM should be able to serve alcohol 24/7 365.25 days a year.

SG forwarded to C Blue 5/25

O'Connor, Kim (MGC)

From: Peter Miller <peter.millersr@gmail.com>
Sent: Friday, May 25, 2018 8:03 AM
To: MGCcomments (MGC)
Subject: No to extended hours for serving alcohol

Categories: Green Category

To Whom it May Concern:

In response to your call for public input, please be advised that I am strongly opposed to extending the hours for serving alcohol at the MGM Casino to 4:00 a.m. I see this as a public safety issue. Those patrons drinking at that hour are likely to have been there for an extended time or coming from somewhere else where they have been drinking. They are not likely coming from home or from the 'office' at that hour. They will, in many/most, cases be impaired. They will then be heading to the roads. Not a good idea. Nothing good can result. Please vote no.

Thanks.

Peter Miller
Westfield, MA

Sent from my iPhone

SG sent to C Blue 5/25/18

O'Connor, Kim (MGC)

From: Carol Campbell <ccampbell@chicopeeindustrial.com>
Sent: Friday, May 25, 2018 2:01 AM
To: MGCcomments (MGC)
Subject: Opinion on exemption of MGM from current liquor law hours

Categories: Green Category

I do not support a change for one business/industry that does not include all.
As a small business owner in MA (not in the same industry) it is difficult to compete against the large corporations.

The goal of regulations is to keep a playing field level for all businesses.

This charge would favor one business that serve alcohol.. over another business that serves alcohol.

Thank you
Carol Campbell
Chicopee Industrial Contractors, Inc
Please excuse my typos
Sent from my IPhone
413 552-7755

SG forwarded to C Blue 5/25/18

O'Connor, Kim (MGC)

From: David Cadran <cadrand@gmail.com>
Sent: Thursday, May 24, 2018 11:08 PM
To: MGCcomments (MGC)
Subject: Public Comment

Categories: Green Category

Hello,

This is a public comment in regards to the MGM application for serving until 4am on the game floor.

As a downtown Springfield resident- I am all for this! Whatever will keep people coming to our downtown, we should do it. MGM has my full support on this.

Best regards,

David Cadran

Sent from my iPhone

SG forwarded to C Blue 5/25

THE CITY OF SPRINGFIELD, MASSACHUSETTS

MAYOR DOMENIC J. SARNO

HOME OF THE BASKETBALL HALL OF FAME

June 8, 2018

Mr. Stephen Crosby, Chairman
Massachusetts Gaming Commission
101 Federal St., 12th Floor
Boston, MA 02110

Re: MGM Springfield Liquor License Application via email: mgccomments@state.ma.us

Dear Chairman Crosby:

The City of Springfield is writing with regard to the Massachusetts Gaming Commission's request for public comment on a draft of MGM Springfield's gaming beverage license application and, specifically, its request for extended hours on the gaming floor.

This is a very specific request to a unique venture and necessary restrictions and limitations are being proposed. I have expressed in the past that I am open minded to the application. Based on the City's review of the application, discussions with MGM Springfield and Commission staff, as well as the supplemental information that MGM Springfield has agreed to supply, I write to express the City's support of the MGM Springfield beverage application with the conditions outlined here.

According to the license application, just like all bars in Springfield, MGM "bars" will close at 2 a.m. However, MGM Springfield is requesting extended alcohol service between 2 a.m. – 4 a.m. limited to the casino floor and so long as the patron is actively gaming and so long as the necessary restrictions and limitations are put in place. I believe this can accomplished safely. However, I would suggest that the Commission monitor the situation closely, and review the extended hours after ninety (90) days of operation, or sooner if significant problems are encountered.

In addition, though substantially complete, it is my understanding that MGM Springfield will be required to submit additional information - as highlighted in their application - before their application will be approved. This information Includes, among other things, further detail on physical features to be included in the outdoor plaza to provide adequate assurance that the interests of the integrity of gaming and/or public health, welfare or safety are met. Specifically, MGM Springfield will provide additional detail regarding physical barriers and signage, as well as its security plans to monitor the outdoor plaza area.

The opportunity for this casino development within the City of Springfield, given the devastation and economic hardship experienced since the 2011 tornado requires that state and local officials cooperate on keeping the focus on the potential for creating economic development in the City and within our region. In short, I urge the Commission to approve the MGM Springfield beverage application with the conditions as outlined above.

Very truly yours,

Domenic J. Sarno, Mayor
City of Springfield

cc: Michael Mathis, President, MGM Springfield
Kevin Kennedy, CDO

The MRA
Massachusetts Restaurant Association
Access • Influence • Protection

160 East Main Street, Suite 2
Westborough, MA 01581
(508) 303-9905 • info@themassrest.org
www.themassrest.org

June 4, 2018

Massachusetts Gaming Commission
101 Federal St., 12th Floor
Boston, MA 02110
Attn: Catherine Blue, General Counsel

Re: Casino Applications to serve alcohol until 4:00 AM

Dear Members of the Massachusetts Gaming Commission,

Please allow this correspondence to serve as written testimony by the Massachusetts Restaurant Association in opposition to any request by any gaming applicant to serve alcohol until 4 AM.

The restaurant industry and the casino industry will never compete on a level playing field when it comes to price for food or beverage. Restaurants are in the business of providing food, beverage and entertainment. This is their livelihood. Casino facilities operate on huge gaming revenues and give away food, alcohol and entertainment as a means of attracting and keeping gamblers. Restaurants should at least be able to compete within the same operating hours.

The MRA is opposed to any casino serving past 2:00AM until all alcohol serving establishments are permitted the same opportunity.

The Massachusetts legislature decided years ago that in the interest of public safety the Commonwealth should have strict alcohol service guidelines. The restaurant industry has responded positively to regulations regarding the responsible sale and service of alcohol. Gaming facilities should be held to the same standard of responsible alcohol service as the thousands of licensed restaurants in the Commonwealth.

One very important public safety factor is that most alcohol served in the Casino after 2:00AM will be free. According to the Massachusetts Gaming Commission enabling statute (Chapter 23K, Section 26, part C): "…..a licensee under this section may distribute **alcohol free of charge** and for on-premises consumption to patrons in the gaming area or as a complimentary service or item in the gaming establishment;" Free alcohol for patrons from 2:00AM until 4:00AM should be a major concern for any government agency.

Different closing times in neighboring communities has always been an issue for licensed establishments. One need only ask any operator with a 2:00AM license what happens when a neighboring community restricts service until 1:00AM. There is an inevitable rush of customers for that last hour of service. Now imagine what the rush will be with the lure of free drinks for another two hours?

Mohegan Sun, Foxwoods and Twin River, the closest competitors to Massachusetts casino operators all restrict alcohol service until 2:00AM.

On behalf of the more than 15,000 food and beverage locations in the Commonwealth we urge the commission to reject any Gaming License applicant the ability to serve any alcohol until 4:00AM.

Sincerely,

Bob Luz
President and CEO

AS Consulting, LLC

PO Box 235

Springfield, Ma 01101

Massachusetts Gaming Commission

101 Federal Street -12th Floor

Boston, Ma 02110

Attn: Catherine Blue, General Counsel

Re: "MGM Springfield Liquor License Application"

Subject: comments

June 4, 2018

We are a consulting firm representing several downtown Springfield liquor and food establishments which employ in excess of 400 individuals. Some of our clients have been in operation for over 40 years.

First and foremost we commend MGM and the City of Springfield for their vision in focusing not merely on Gaming but expanding it into an Entertainment mecca. This area, definitely needs an economic development plan. Entertainment could become such a hub and driver.

However, we also believe that the hours of serving liquor should be extended to 4:00 for all downtown hospitality/entertainment establishments for both economic and safety reasons. To

that end we would ask the Gaming commission to approve MGM request AND also refer such decision to the Alcohol Commission for their recommendation.

Thank you for your interest,

Sincerely,

Michael Brisbois

Manager

AS Consulting, LLC.

Enrique and Steve,

I'm emailing in follow up to our conversation last week; thank you for your willingness to consider DPH input regarding the potential expansion in the number of hours casinos can serve alcohol. Please see below from our experts in our Bureau of Substance Addiction Services. Thank you.

Scientific literature & impact of extending drinking hours: in weighing the pros and cons of increasing the alcohol service hours by two hours, we examined systematic reviews of multiple studies. The conclusions quoted and referenced below are consistent:

- "There was sufficient evidence in ten qualifying studies to conclude that **increasing hours of sale by 2 or more hours increases alcohol-related harms**. Thus, disallowing extensions of hours of alcohol sales by 2 or more should be expected to prevent alcohol-related harms, while policies decreasing hours of sale by 2 hours or more at on-premises alcohol outlets may be an effective strategy for preventing alcohol-related harms." → Hahn, R. A., Kuzara, J. L., Elder, R., Brewer, R., Chattopadhyay, S., Fielding, J. & Lawrence, B. (2010). Effectiveness of policies restricting hours of alcohol sales in preventing excessive alcohol consumption and related harms. *American journal of preventive medicine*, *39*(6), 590-604. (attached)
- "Forty-four studies on density of alcohol outlets and 15 studies on hours and days of sale were identified through a systematic literature search. The majority of studies reviewed found that alcohol outlet density and hours and days of sale had an impact on one or more of the three main outcome variables, such as overall alcohol consumption, drinking patterns, and damage from alcohol. Conclusions: **Restricting availability of alcohol is an effective measure to prevent alcohol-attributable harm**." → Popova, S., Giesbrecht, N., Bekmuradov, D., & Patra, J. (2009). Hours and days of sale and density of alcohol outlets: impacts on alcohol consumption and damage: a systematic review. *Alcohol & Alcoholism*, *44*(5), 500-516. (attached)
- https://alcoholjustice.org/news-2/blog/209-trading-hours/1335-4-a-m-last-call-research-update-splash-effect-means-one-city-s-party-is-another-city-s-pain

From a public health perspective, there are many factors to consider when weighing whether extending the timeframe casinos can serve alcohol from 2 am - 4 am will have an **adverse effect on the surrounding populations**. It is important to think of these consequences from a universal, as well as a selective/indicated population perspective. From a universal perspective, there are factors that will adversely affect the general population.

- First, scientific literature has shown that extending hours of alcohol sales will produce alcohol related harms for the general population (see above).
- Second, this expansion might have a direct impact in the increase of DUI (http://walkerd.people.cofc.edu/360/AcademicArticles/JHE.pdf). Local emergency departments will need to prepare for increased patients, and local communities will need to determine how to get patrons home safely. For example, Connecticut conducted an extensive needs assessment to determine public health impact, and as a result, determined that a "safe ride" program for patrons to get home safely and reduce DUI (http://www.mapc.org/wp-content/uploads/2017/11/Draft-Casino-Impact-Assessment-2013.pdf).

- Third, there is also a direct impact on violence. A Norwegian study found that for every one hour extension, there was a statistically significant increase of 4.8% on assaults (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3380552/).

From a selective/indicated perspective, **there are individuals and segments of the population that are already at risk. It is critical to think about the patrons that will be gambling on the casino floor that fall into this segment of the population.** A percentage of those individuals will be at risk gamblers, or have gambling disorder 9GD). When considering this group, it is critical to think about the high rate of co-morbidities among individuals with GD; specifically, there is a large overlap between SUD and GD, as well as GD and other psychiatric illnesses. Specifically the national comorbidity study & replication study conducted by Harvard Medical School and the World Health organization found that among individuals with gambling disorder 46.2% also had an SUD. Among SUD's, AUD was the most prevalent (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2293303/).

- In the BSAS treatment system, we see the same overlap between AUD and GD. In FY 16 among enrollments to BSAS treatment, 5.2% (n=4,766) reported a history among problem gambling. Among these individuals, the majority reported alcohol as their primary drug (41%). Also nearly half were between 25-34, and 82% were male. Part of the DSM 5 diagnosis for any SUD, includes factors regarding consequences. For individuals that have both AUD and GD, and engage in drinking and gambling simultaneously; it can be difficult to set limits with either behavior. Studies have found that alcohol consumption is positively associated with the likelihood of experiencing any gambling-related problems and with the number of problems experienced (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2710110/). Given the large overlap between SUD and GD, it is also critical to think about the individuals that have an opioid use disorder.
- Similar to responsible gambling frameworks (Blaszczynski, A., Ladouceur, R., & Shaffer, H. J. (2004). A science-based framework for responsible gambling: The Reno model. *Journal of Gambling studies*, *20*(3), 301-317.), it is critical to protect this segment of patrons by equipping casino employees with Narcan. There may be an opportunity to expand upon the casino kiosk staff and equip/train them on the use of Narcan and overdose prevention.

- http://walkerd.people.cofc.edu/360/AcademicArticles/JHE.pdf It is a link to a Journal of Health Economics.

Lindsey Tucker
Associate Commissioner
Massachusetts Department of Public Health
Cell: 857.300.7937

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EPIDEMIOLOGY AND POLICY

Hours and Days of Sale and Density of Alcohol Outlets: Impacts on Alcohol Consumption and Damage: A Systematic Review

Svetlana Popova[1,2,3], Norman Giesbrecht[1,2,*], Dennis Bekmuradov[1] and Jayadeep Patra[1]

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Abstract — Aims: The aim of this study was to examine recent research studies published from 2000 to 2008 focusing on availability of alcohol: hours and days of sale and density of alcohol outlets. **Methods:** Systematic review. **Results:** Forty-four studies on density of alcohol outlets and 15 studies on hours and days of sale were identified through a systematic literature search. The majority of studies reviewed found that alcohol outlet density and hours and days of sale had an impact on one or more of the three main outcome variables, such as overall alcohol consumption, drinking patterns and damage from alcohol. **Conclusions:** Restricting availability of alcohol is an effective measure to prevent alcohol-attributable harm.

BACKGROUND AND CONTEXT

The World Health Organization (WHO, 2002) has indicated that in developed countries the harm from alcohol is ranked third out of 26 risk factors examined in terms of their contribution to disease, disability or mortality. The top two were tobacco and blood pressure, respectively. Alcohol was third, and ahead of the following risk factors: high cholesterol, body mass index, low intake of fruit and vegetables, physical inactivity and illicit drugs.

However, in contrast, in recent years, there are initiatives in place that promote alcohol, increase access to alcohol and stimulate alcohol sales. For example, in the UK, the rise in the affordability of alcohol by 65% between 1980 and 2006, the extension of hours of sale for both on-premise and off-premise outlets in 2003, combined with extensive advertising and the promotion of alcohol have been linked with an increase in consumption and drinking-related damage (Heather, 2006; Leon and McCambridge, 2006; Anderson, 2007; British Medical Association Board of Science, 2008).

In Canada, there has been extensive marketing and promotion of alcoholic beverages by liquor boards working in concert with alcohol producers (Giesbrecht, 2006; Giesbrecht *et al*., 2006). In recent years, all jurisdictions within Canada have undergone substantial changes in how alcoholic beverages are distributed and sold. These changes have, for the most part, been gradual, while in some cases they have taken place concurrently. The most notable changes have included: an increase in alcohol marketing and promotion, an increase in alcohol density within retail outlets, an extension of hours and days of sale, and the use of discounts or sale prices in order to promote sales.

Provincial liquor boards and commissions include management of alcohol sales as part of their mandate. However, the current control functions are narrowly restricted to social responsibility initiatives, interventions to control smuggling, concerns about the quality of products, and some health promotion campaigns, such as prevention of drinking and driving. The social responsibility functions do not include controlling overall sales or reducing high-risk drinking, both of which have been linked with population-level rates of damage, caused by alcohol consumption (Edwards *et al*., 1994; Babor *et al*., 2003). This perspective presents an incongruity between, on one hand, the greater commercial orientation and an emphasis on increasing alcohol sales and, on the other, an increase in damage and the costs that this commercial orientation will likely lead to.

This skewed current emphasis on the market factors stands in a sharp contrast to over 40 years of international research on the associations between access to alcohol, drinking patterns and damage from alcohol consumption. The body of alcohol-related research has repeatedly shown that an increase in alcohol sales is strongly linked to an increase in drinking-related damage, as demonstrated by three international projects affiliated with WHO (Bruun *et al*., 1975; Edwards *et al*., 1994; Babor *et al*., 2003). Furthermore, a study of 14 European countries (Norström, 1999) established a strong association between documented trends over a 50-year period, in overall alcohol sales and mortality from alcohol-specific causes (Ramstedt, 2001), trauma (Rossow, 2001; Skog, 2001), chronic disease (Ramstedt, 2004b), as well as total mortality (Norström and Skog, 2001). Similar findings have emerged from a study conducted a few years ago, focusing on Canada and its provinces for the period 1950–2000 (Ramstedt, 2003; Skog, 2003; Norström, 2004; Rossow and Hauge, 2004; Ramstedt, 2004a, 2005).

Concurrent with extensive promotion, overall alcohol consumption and high-risk drinking have been increasing in Canada in recent years. In Canada, there has been an increase in the rate of alcohol consumption since about 1996 (Statistics Canada, 2002; Statistics Canada, 2007), with some variation between provinces. During this time, the percentage of drinkers who reported drinking 5+ alcoholic beverages per occasion, at least monthly, has also increased (Statistics Canada, 1997, 2005).

It is expected that these initiatives to increase access to alcohol and stimulate higher levels of overall consumption will contribute to an increase in the risks from alcohol, damage from alcohol and attendant health, social and law enforcement costs (Rehm *et al*., 2006, 2008). This paper examines recent research studies focusing on two interventions that have been shown

to be particularly potent in the past in controlling consumption and damage from alcohol consumption, namely, hours and days of sale, and alcohol outlet density (AOD) (Babor *et al*., 2003, chapter 16; Stockwell, 2006).

METHODS

A systematic literature search was performed in multiple electronic bibliographic databases, including: Ovid MEDLINE, PubMed, EMBASE, Web of Science (including Science Citation Index, Social Sciences Citation Index, Arts and Humanities Citation Index), PsycINFO, the Cochrane Database of Systematic Reviews and Google Scholar. The search was conducted using the following keywords, in different combinations: alcohol, availability, outlet density, hours of sales, drinking pattern, morbidity, mortality, drinking and driving, injuries, crime and violence.

The available literature was searched from January 2000 to December 2008, in reference to the publication date. The search was not limited geographically and to English language publications. The last nine full years were chosen in order to provide the most recent evidence, with a sufficient number of studies and to facilitate presentation of each study along several dimensions (see Tables 1 and 2). As noted below, there is generic convergence in the findings from our systematic review reported here, and what has been reported previously (e.g. Edwards *et al*., 1994; Holder and Edwards, 1995; Babor *et al*., 2003; Stockwell, 2006).

Studies were excluded from the analysis for any of the following reasons:

- There was no assessment of the impact of an intervention or dependent variable.
- There was not sufficient information on the key variables, such as density of outlets or hours or days of sale.
- It was a meta-analysis or systematic review.
- The studies that were published in iteration.
- If the articles were available in abstract form only.

Data extraction

The titles and abstracts, where available, were independently reviewed by two researchers to identify potentially relevant papers. The papers were obtained and independently read in full by two researchers. Differences were resolved by discussion and if necessary, by a third party. Reasons for exclusion were identified. The data were extracted based on inclusion and exclusion criteria defined above and on the pre-specified range of outcomes detailed in Tables 1 and 2. A second member checked the table entries for their accuracy against the original articles.

Selected studies were summarized using the following categories: author and date of publication, place and year of study; design/sample and main indicators; interventions; findings, organized by (i) alcohol consumption, (ii) drinking pattern and (iii) damage; and policy implications and comments.

The findings of this study were organized into two main categories: density of alcohol outlets, and hours and days of sale. In each case, the impacts of a change were examined on the following dimensions: overall alcohol consumption, drinking patterns and damage from alcohol. Overall consumption refers to either the average volume of alcohol consumed by respondents (for example, if it is a survey-based study), or total sales of alcohol. Drinking patterns refer to a combination of variables, for example, how alcohol consumption is distributed over time. Measures of high-risk drinking are as indicated, for example, by blood alcohol levels. How high-risk drinking (such as, 5+ drinks per occasion) is distributed by age group or gender, and whether the percentage of persons at different levels of consumption increased or decreased as a result of the policy change, was also explored.

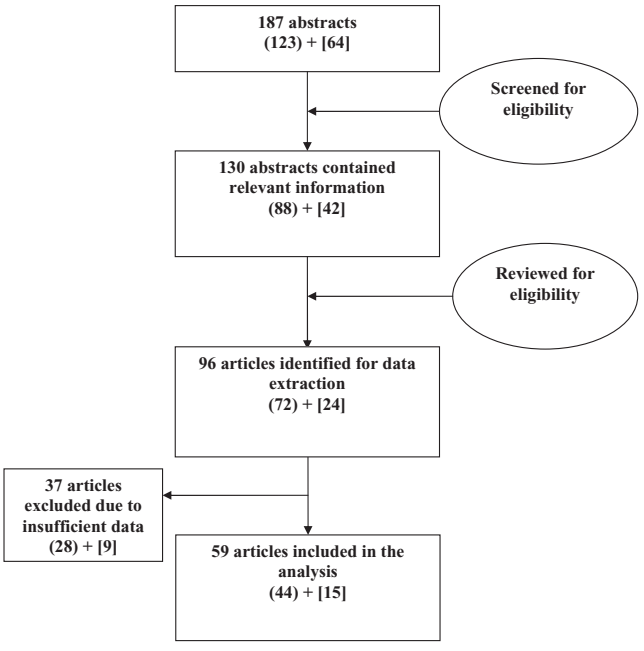

Fig. 1. Flowchart for the literature review on outlets density and hours and days of alcohol sales.

Finally, damage from alcohol is broadly defined, including both morbidity and mortality, and involving trauma (both intentional and unintentional causes), social problems and chronic disease. There are 45 types of trauma and chronic diseases associated with alcohol consumption (English *et al*., 1995; Babor *et al*., 2003). More than 30 ICD-10 three- or four-digit codes include alcohol in their name or definition (WHO, 2007) and over 200 ICD-10 three-digit disease codes in which alcohol is part of a component cause (Rothman *et al*., 2008).

RESULTS

The main search identified 187 abstracts, which resulted in 59 articles selected for full review and included in the present analysis (44 studies on AOD and 15 studies on hours and days of sale). The studies were found for the following countries: USA (36 studies), Australia (8), Canada (5), New Zealand (2), UK (2); and one study in each of Brazil, Iceland, Mexico, Norway, Sweden and Switzerland. The results of the systematic review are shown in Fig. 1.

Density of alcohol outlets

Studies, which examined the AOD, are summarized in Table 1.

A few studies examined both drinking behavior (overall consumption and patterns) and alcohol-related damage

Table 1. Recent studies (2000–2008) on the impact of alcohol outlet density on alcohol consumption, drinking patterns and damage

Study; place and year of study	Design/sample of the study and main indicators	Findings: (A) drinking levels; (B) drinking patterns; (C) damage; and Policy implications and comments
(Trolldal, 2005b); Québec, Canada, 1950–2000	Interrupted time-series analysis focusing on Quebec, with rest of Canada as the control area; impact of policy changes—wine in grocery stores in 1978, large grocery chain stores allowed to sell wine in 1984 on liters of pure alcohol per capita aged 15+ (total and by beverage); alcohol prices and disposable income as control variables	(A) 10% increase in wine sales, sales of spirits and beer not significantly affected, and less effect on total sales. For 1983–1984, there was no immediate significant increase in sales of wine The estimated effect of the 1978 policy change was considered modest and likely due to a limited range of wines impacted by this change. Also, it is difficult to untangle impact of these policy changes from concurrent ongoing marketing initiatives by the government retail system
(Trolldal, 2005a); Alberta, Canada, 1950–2000	Interrupted time-series analysis focusing on Alberta, with the rest of Canada as the control area; impact of alcohol retail privatization (during 1993–1994) on total and beverage-specific adult per capita drinking (in liters of pure alcohol)—controlling for income and alcohol price—and fatal motor vehicle traffic accidents—controlling for number of motor vehicle registrations	(A) Alcohol retail privatization had a significant permanent effect on the sale of spirits, the effect on wine and beer sales was not significant, and the effect on spirits was not large enough to affect total sales. (C) The effect on the number of fatal motor vehicle traffic accidents was not significant While the privatization had an impact on AOD and hours and days of sale, it is noteworthy that alcohol sales were never allowed in ordinary grocery stores. Sales at the wholesale level continued to be under government monopoly control. The new system restricted the development of liquor store chains
(Norström, 2000); Norway, 1965–1995	Time-series analysis; number of public drinking places per 10,000 inhabitants (aged 15+); crime statistics (violence charges and convictions) per 100,000 inhabitants	(C) Statistically significant positive relationship was found between AOD and violence charges. For convictions, the relationship was positive, but of borderline significance ($P = 0.06$) Other studies support conclusion, but first to be based on longitudinal data. To test for robustness and cultural specificity, replication studies in other drinking cultures are warranted
(Pollack *et al*., 2005); CA, USA, 1979–1990	Multi-level analysis using cross-sectional surveys from four north/central California cities ($n = 8197$, 82 neighborhoods) linked to neighborhood deprivation variables. Three measures of alcohol access: AOD, closest distance of outlet to respondent's home and number of outlets within 0.5 mile radius of home. Separate analysis: on- and off-premise outlets	(A) The most deprived neighborhoods had substantially higher levels of AOD than the least deprived (46% versus 15%). Multi-level analysis showed that the least deprived neighborhoods were associated with the heaviest alcohol consumption even after adjusting for individual-level socio-demographic characteristics. (B) Alcohol availability was not associated with heavy drinking and thus, did not mediate the relationship between neighborhood deprivation and heavy alcohol consumption Mismatch between supply and demand may cause people in the most deprived neighborhoods to disproportionately suffer the negative health consequences of living next to an AO
(Kypri *et al*., 2008); New Zealand, 1983	Examined the geographic density of AOs and associations with drinking patterns and problems among University students. 2550 students (mean age = 20.2) at six campuses were surveyed, and counts of outlets within 3 km from each campus were tested for their non-parametric correlation with campus drinking levels and related problems	(A) There were consistent significant associations of outlet densities with all outcomes in student-level-adjusted models. (C) Correlations for campus-level data were 0.77 ($P = 0.07$) for drinking and personal problems and 0.31 ($P = 0.54$) for second-hand effects Increasing AOD, and particularly off-premise licenses, may increase alcohol-related harm among university students
(Cohen *et al*., 2006); Los Angeles (LA) County, USA, 1988–1996	Individual growth models to examine the independent effects of AO and damaged buildings on gonorrhea. Prevalence of gonorrhea, licensed AO, properties damaged during civil unrest and destruction of liquor stores and other businesses in 1992	(C) The individual growth model explained over 90% of the residual variance in census tract gonorrhea rates. After the civil unrest, a unit decrease in the number of AO per mile of roadway was associated with 21 fewer gonorrhea cases per 100,000 (po.01) in tracts affected by the unrest compared to those not affected The findings suggest that efforts to control STDs, including gonorrhea and HIV, should address contextual factors that facilitate high-risk behaviors and disease transmission
(Gorman *et al*., 2001); NJ, USA, 1990	Examine the relationship between neighborhood social structure, AODs and violent crimes. Data were collected for 98 block groups and analyzed using bivariate, multivariate and spatial analyses	The strong association was between AO and violent crime. Even after variables were controlled for, areas with higher AO were found to have higher rates of violent crimes (explained about 1/5 of variability in violent crimes) It was found that AO only affects the immediate community and not surrounding areas. Hot spots of crime were not taken into consideration and may have affected the results found (i.e. areas where night time businesses are open, schools, etc.). Also, this study does not examine the mechanisms behind AO that account for the higher rates of crimes observed in such communities

(Peterson *et al*., 2000); Columbus, OH, USA, 1990	Explore whether certain local institutions (i.e. AO) provide a mechanism linking economic deprivation and residential instability to criminal violence; rates of total and individual violent crimes were examined for 177 census tracts	Institutional mechanisms, such as bars, did not explain why economic deprivation and residential instability are strongly linked to violent crime The findings demonstrate that communities may reduce violent crimes somewhat by preventing some types of local institutions (i.e. bars) and by promoting the development of other types (e.g. recreation centers)
(Lipton and Gruenewald, 2002); CA, USA, 1990–1991	A spatial population model of the production of violence used to examine the relationships between population characteristics of target and surrounding areas and violence rates	(C) Bar density was found to be strongly associated with greater rates of assault, while restaurant density was associated with less violence. Both appeared to have the greatest effect in densely populated areas. Local and nearby population characteristics were also found to be related to greater rates of violence While limited to cross-sectional data, the current study suggests that AO, in the presence of socio-economic measures, moderate the occurrence of violence in urban areas
(Gyimah-Brempong, 2001); USA, 1990 and 1992	Investigate the relationship between alcohol availability (measured as alcohol license density) and crime. Census tract data from Detroit was used	(C) Alcohol availability had a significantly positive effect on the total crime rate, violent crime rate, property crime rate and homicide rate (alcohol elasticity of crime rates: 0.92, 0.82, 0.87, 0.12, respectively)
(Escobedo and Oritz, 2002); New Mexico, USA, 1990–1994	Ecological design; linear regression model. Assessed the relationship between liquor AOD and alcohol-related health outcomes, including arrests for driving while intoxicated, alcohol-related crashes, crash fatality (adjusted for age, sex and minority status) and alcohol- and drug-related deaths	(C) Suicide, alcohol-related crash, and alcohol-related crash fatality are significantly associated with AOD. Data also show that, compared with the first tertile, suicide and alcohol-related crash rates increase about 50% and the alcohol-related crash fatality rate increases two-fold with the third tertile of AOD. Greater availability of AO is associated with higher rates of suicide, alcohol-related crash, and alcohol-related crash fatality. With one unit increase in the rate of liquor outlet density, per every 1000 population the rate of suicide increases by 0.23, the rate for alcohol-related crash by 2.4 and the rate for alcohol-related crash fatality by 0.22 In New Mexico, counties with lower median family income tend to have higher liquor outlet density. Programs to reduce alcohol-related injury by reducing availability of alcohol in communities where many of its residents are of low socio-economic status should be implemented
(Scribner *et al*., 2007); Los Angeles, CA, USA, 1990–1996	Voting rates were analyzed to determine if a decrease on AOD is related to a change in social capital, subsequent to the LA civil unrest of 1992. It was predicted that a loss of AO would result in an increased social network. AO was divided into onsite and offsite locations and civil engagement (social capital) was measured by how many residents voted. They also looked at rates of economic inequality, economic deprivation, crime rates and other features of the neighborhoods. The data were analyzed using descriptive, bivariate and multivariate analyses in cross-sectional and longitudinal analyses	Found that after the riots, more AOs were closed down in areas where most damage had occurred as well as communities where the social capital opportunity was higher, where there was a greater proportion of Hispanic, Asian and M residents, and with a greater population between 15 and 44 years of age. They also found that voting rates increased regardless of whether AOs were decreased, but the increase was substantially higher in communities where AOs were surrendered (i.e. licenses surrendered) Seems that a decrease in AO acts as a catalyst for increasing social capital through expanding social systems and this held up in spite of economic differences, but not inequalities between communities. Limitations exist in that voting rates may not be an accurate predictor of social capital and migrating effects due to the riot were not taken into consideration
(Yu *et al*., 2008); Los Angeles, CA, USA, 1990–1999	A hierarchical model was used to evaluate the impact of the '1992 Civil Unrest' in LA on crime; civil unrest lead to damaged AO, therefore decreased alcohol sales. A total of 480 census tracts: 144 tracts underwent AO closures, while 336 did not. Measure of assaults was obtained from the LA Police Department	(C) A positive association between alcohol availability and assault; beginning 1 year after the civil unrest, on average, the census tracts that experienced AO closures experienced more dramatic decreases in assault rates This natural experiment proves important in implementing policy changes to reduce alcohol-related assault and crime
(Gyimah-Brempong and Racine, 2006); Detroit, MI, USA, 1992	This study uses census tract data and robust nonparametric estimation methods to investigate the relationship between alcohol availability and crime rates	(C) It is found that there is a positive and statistically significant relationship between crime rates and alcohol availability with calculated elasticities of 0.34, 0.37, 0.35 and 0.27 for total crime, violent crime, economic crime and homicide, respectively The effects of alcohol availability on crime rates vary with the density of alcohol availability Alcohol control policies should be evaluated at different levels of alcohol availability, in contrast to current policies, which are based on the assumption that the effect of alcohol control policies is the same regardless of the level of alcohol availability

(*continued overleaf*)

Table 1. (Continued)

Study; place and year of study	Design/sample of the study and main indicators	Findings: (A) drinking levels; (B) drinking patterns; (C) damage; and Policy implications and comments
(LaScala *et al*., 2001); California communities, USA, 1992–1996	A geostatistical analysis of ecological data to examine the relationships of neighborhood characteristics, including alcohol availability and alcohol consumption patterns to pedestrian injury collisions. Archival and individual-level data from a general population telephone survey were obtained from four California communities. Units of analysis were geographic areas within each community, defined by the spatial clustering of telephone survey respondents. Independent variables: number of cross streets, bars, restaurant and off-premise outlets per km of roadway; dependent variable: pedestrian injury rate	(C) Alcohol-involved pedestrian collisions occurred more often in areas with greater bar densities and greater population, and where the local population reported drinking more alcohol per drinking occasion. Pedestrian collisions not involving alcohol occurred more often in lower income areas with greater population and cross-street densities, and in areas having either younger or older age populations The identification of neighborhood variables associated with pedestrian collisions has important implications for policy formation and targeted prevention efforts
(Treno *et al*., 2001); CA, USA, 1992–1996	Alcohol availability, both on and off-premise, self-reports of injuries in past 6 months, type of injury, cause, location, demographic characteristics of respondents. Outlets linked with survey respondents through geographic mapping and assigned an availability measure *N* of outlets within 2 km radius for on and off separately. Telephone survey of 13,441 respondents from four communities	(C) Self-reported injury is related to the density of both on- and off-premise AO, independent of the other predictors in the model. There may be several explanations of this relationship. Outlets may be associated with more drinking, which predisposes individuals to injury. Outlets might influence neighborhood characteristics to put individuals at risk of injury, independent of their drinking. Or AO may, merely, be a surrogate measure for broader community conditions, although this possibility is partially controlled for in this study through the inclusion of individual and community-level covariates in the analysis models These three possible explanations have different policy implications: (1) interventions need to target problematic drinking behavior; (2) interventions may be most profitably targeted toward altering alcohol access, independent of drinking behavior; and (3) targeting either outlets or drinking would be irrelevant to injury
(Gruenewald *et al*., 2002); CA, USA; 1993–1996	The study examines the degree to which the physical availability of alcohol, as measured by outlet densities, is related to self-reported individual drinking patterns, preferred drinking location, as well as both *driving after drinking* (DAD) and *driving while intoxicated (*DWI). $N = 7826$ drinkers from 1353 zip code areas in California using general-population telephone survey. HLM was used to relate AOD within and surrounding respondents' area of residence to respondents' drinking and their drinking and driving. Measures of individual alcohol consumption: drinking frequency, drinks per occasion and variance in quantities consumed per occasion. Preferred drinking locations included bars, restaurants and homes or friends' homes. DAD was defined as driving a motor vehicle within 4 h of having one or more alcoholic drinks, and DWI was defined as driving after having too much to drink and drive safely. Geographic measures of AOD were obtained for bars, restaurants and off-premise establishments, using zip codes as geographic units of analysis	(A) Whereas restaurant densities were directly related to greater drinking frequencies and DAD, bar densities were inversely related to DAD. (C) Drinking and driving was strongly related to drinking location preference (e.g. bars and restaurants) only when considered simultaneously with individual drinking patterns, particularly drinking frequency. *Conclusions*: Increased restaurant density is strongly related to a higher rate of both self-reported DAD and drinking frequency. The strongest influence on both DAD and DWI is preferred drinking location, considered together with individual drinking patterns. AOD and preferred drinking location when considered together with individual drinking patterns support DAD and thereby increase the potential for alcohol-related accidents. (B) There were no direct effects of drinking patterns on drinking and driving
(Reid *et al*., 2003); Kansas City, MO, USA, 1995	Hierarchical regression analysis was used to determine the independent association between AOD and the rate of assaultive violence, socio-demographic factors, AOD and rates of assaultive violence across 89 inner-city census tracts in Kansas City, Missouri	(C) Socio-demographic variables predicted 61% of the variance in assaultive violence, but an additional 9% of the variability was explained by the AOD. AOD contributed significantly to the explained variance of the regression model and was associated with higher rates of assaultive violence in this Midwestern city Inner-city areas may be especially vulnerable to high concentrations of AO, especially when they are characterized by a concentration of deteriorated housing, predatory lending offices and a paucity of full-service supermarkets. In these contexts, even low AOD may function as a tipping point that portends a spiraling crime rate
(Gruenewald and Remer, 2006); CA, USA, 1995–2000	Population-based ecological approach. Longitudinal data from 581 consistently defined zip code areas represented in the California Index Locations Database, a geographic information system that coordinates population and ecological data with spatial attributes for areas across the state. Demographics, hospital discharge data, AO, retail data, violent assaults	(C) Lower median household income and greater percentages of minorities (African American, Hispanic and Asian) were related to increased rates of violence. A 10% increase in the number of off-premise AO and bars were related to 1.67 and 2.06% increases in violence rates across local and lagged spatial areas, respectively. Every six outlets accounted for one additional violent assault that resulted in at least one overnight stay in a hospital. These effects increased with larger M populations, doubling with every 3% increase. Assault rates were most strongly related to median household incomes and minority populations within zip code areas. Controlling for changes in assault rates related to these measures, greater numbers of licensed alcohol retail establishments, especially bars and off-premise outlets, were related to assault rates Failures to regulate the growth in the number of bars will increase rates of violence, especially in urban areas

(Treno *et al*., 2007); CA, USA, 1995–2000	The study examines aggregate-level archival data on population and place characteristics collected for 581 indexed zip code areas. Panel model analysis enabled the examination of temporal effects andchanges in AO numbers to population-based rates of alcohol-related motor vehicle accidents. Demographics, *number of AO, retail data. The hospital discharge data (HDD)* included automobile crashes resulting in at least one overnight stay; *Automobile crash data:* Statewide Integrated Traffic Record Systems (SWITRS) data included police reports of suspected alcohol-related automobile crashes	(C) Changes in outlet densities over time, across 581 stable zip code locations, were directly related to traffic injury rates requiring hospitalization, but which may or may not have involved alcohol (HDD data) and to crash rates reported by police that were suspected to have had alcohol involved (SWITRS data). Local and lagged population characteristics were also related to both outcomes. Importantly, in support of established cross-sectional findings, bar and off-premise outlet densities were related to both measures
(Nielsen *et al*., 2005); FL, USA, 1996–1997	Multivariate regression analyses were used to assess the impact of AOD on aggravated assault and robbery victimization in Latino and black populations. 70 census tracts with 500 or more residents were evaluated	(C) Higher AOD was associated with more Latino aggravated assault and robbery victims
(Lapham *et al*., 2004); Albuquerque, NM, USA, 1996–2000	Investigated the spatial relationship between drive-up liquor window locals and alcohol-related traffic accidents for 2 years before and after New Mexico banned drive-thru alcohol sales. Cross-sectional and longitudinal (time series) regression analyses for two geographical areas: one model for the entire state (including Albuquerque) and a model focusing on the Albuquerque study area	(C) Out of all NM liquor licenses, 189 (9%) included drive-up sales, which co-occurred with on- or off-premise licenses (94%). The rate of non-pedestrian alcohol-related crashes relative to non-pedestrian total crashes showed an increasing trend prior to the closure and a decreasing trend after the closure. Cross-sectional analyses in Albuquerque revealed that the percentage of alcohol-involved crashes was not related to densities of on- or off-premise AO per km of roadway, or to the percentage of drive-up outlets. Statewide, the percentage of drive-up outlets was not significantly related to the percentage of alcohol-related crashes within census tracts, but was positively associated with the percentage of alcohol-related crashes in surrounding census tracts. A statistically significant relationship did not exist between the number of drive-ups and percentage of alcohol-related crashes in either of the longitudinal models Despite the declining rate of alcohol-related crashes following closure of drive-up liquor windows, both in Albuquerque and statewide, regression models using spatial data do not demonstrate, definitively, an association between the decline and the closure of the drive-up liquor windows
(Livingston, 2008b); Australia, 1996–2005	Examined 9 years of data using fixed-effects models to determine the relationship between three types of AOD (using liquor licensing records) and assault (using police records of night time assaults)	(C) The initial models found overall positive relationships between all three types of AOD and violence. When separate models were developed for different clusters of postcodes, the link between AOD and violence was significant in all neighborhood types, although specific relationships varied substantially Changes in the number of AOs in a community are linked to changes in the amount of violence a community experiences. Since the number of licenses for alcohol establishments is increasing, detrimental effects on the community may be expected
(Treno *et al*., 2003); CA, USA, 1998–2000	Investigates the relationship between AOD and self-reported underage drinking and driving, acquired through two telephone surveys. A final sample of 614 individuals, who had complete information on all relevant measures (323 M and 291 W). Hierarchical Linear Modeling Variables: *Drinking* and *driving (DAD)* and *riding with drinking drivers (RWDD)*	(C) At the aggregate or city level, AO density, as measured by the number of on- and off-premise establishments licensed to sell alcohol, was associated with both DAD and RWDD. These effects were moderated by a number of individual-level effects, with younger respondents and W more likely to be affected by outlet densities. There was a main effect of AOD on DAD ($P = 0.032$) (i.e. higher densities were associated with more frequent DAD). This effect was moderated by a number of individual-level effects, with younger respondents, and W more likely to be affected by outlet densities. The analysis of RWDD found a similar main effect for density, with moderated effects also for age and gender. Prompted by concerns that these effects were specific to either on- or off-premise densities, separate analyses predicting DAD were performed for each. These analyses produced virtually identical results, with the notable exception being one-tailed (as opposed to two-tailed) significance for density ($P = 0.071$) and density $\times$ age interaction ($P = 0.093$) effects The findings provide support for the implementation of policies targeting alcohol AOD reductions. Areas with a large number of such outlets provide ample opportunities to youth for alcohol purchases

(*continued overleaf*)

Table 1. (Continued)

Study; place and year of study	Design/sample of the study and main indicators	Findings: (A) drinking levels; (B) drinking patterns; (C) damage; and Policy implications and comments
(Freisthler and Weiss, 2008); USA, 1998–2001	The current study incorporates three aspects of the substance use environment in a panel study of 58 California counties over 4 years ($n = 232$) to study this relationship for referrals to child protective services (CPS) for child abuse and neglect. The data were analyzed using Bayesian spatio-temporal panel models	Use of welfare, the number of AOs per population and the number of drug-related arrests per population are positively related to referrals while unemployment and admissions to publicly funded alcohol and drug user treatment programs are negatively correlated to referrals. Significant spatial structure and space–time relationships are also found. The findings indicate that supply of alcohol and drugs (as measured by number of alcohol outlets and arrests for drug use and sales) may increase risk for being referred to CPS, but treatment for substance use does not increase the risk for referral
(Freisthler *et al*., 2007); CA, USA, 1998–2003	The purpose of the study was to determine how changes in the number of AO is related to rates of referrals, substantiations and foster care entries as a consequence of child maltreatment; examines temporal effects of AOD; data were obtained from the California Department of Social Services and California Department of Alcoholic Beverage Control, respectively. Data were analyzed using spatial random effects panel models, using Spatial Statistical Systems	It was found that areas with a greater amount of bars expressed higher rates of child maltreatment, but areas in which local and lagged bars as well as off premise AOs were increased was correlated with higher rates of foster care placements, but an increase in restaurants decreased child maltreatment
(Weitzman *et al*., 2003); Boston, USA, 1999–2000	Designed to determine whether AOD correlated with heavy and frequent drinking and drinking-related problems. AOD, survey measures of drinking using a geographic information system and the Harvard School of Public Health College Alcohol Study ($n = 3421$; site $n = 8$). Initial analyses tested rank-order correlations between AOD and drinking among all student drinkers. Next, rank-order correlations between AOD and drinking measures among subgroups of student drinkers were tested	(A) AOD was correlated with heavy drinking, frequent drinking and drinking-related problems. For W: underage students and students who picked up binge drinking in college were affected. (B) Overall, there was a significant correlation between AOD and heavy drinking (i.e. consumed 5+ drinks at an off-campus party) for all drinkers (r, with several sites tied in rank). This finding was found to hold for multiple subgroups of students, specifically for M and students who picked up binge drinking in college. AOD was correlated with frequent drinking (i.e. drank on 10+ occasions in past 30 days) for all drinkers, with multiple ties in rank, non-Greek affiliated students, underage students, which had multiple ties, and students who picked up binge drinking in college. (C) AOD was correlated with problem drinking (i.e. reporting 5+ problems since the beginning of the school year) among all drinkers, W, underage students, average students and students who reported picking up binge drinking in college
(Britt *et al*., 2005); Minneapolis, MN, USA, 2000	Onsite and offsite alcohol establishment rates were compared to incidence of violence (obtained through the police department) in 79 neighborhoods in Minneapolis to determine any relationships present. The relationship between crime and AOD was determined cross-sectionally using Bayesian analytical methods	(C) Found a significant relationship between AOD and crime even in the presence of fixed effects and spatial smoothing. The north and central regions of Minneapolis were found to have both the most AOs and crime rates. It was found that the erection of just one AO can increase crime by five crimes per 1000 individuals per year (only severe crimes were studied) A possible limitation is that daytime employment residents were included in the study and not night time non-residents of the city, which may yield different results
(Freisthler *et al*., 2004); USA, 2000	To determine whether neighborhood alcohol access is related to substantiated reports of child physical abuse and neglect. A cross-sectional study was implemented using spatial regression procedures to examine the relationship between number of bars, restaurants and off-premise outlets per population, and rates of child abuse in 940 census tracts	(C) Spatial regression techniques were applied and demonstrated that the number of off-premise outlets per 1000 of the population had a positive effect on the rate of child physical abuse, and the number of bars per 1000 of the population had a positive effect on the occurrence of substantiated neglect
(Freisthler *et al*., 2005); California, USA, 2000	To examine neighborhood rates of child maltreatment for 304 block groups in one northern California city. A cross-sectional design	(C) Higher concentration of bars and numbers of incidents of drug possession were positively related to rates of child maltreatment when controlling for neighborhood demographic characteristics
(Gorman *et al*., 2005); Houston, TX, USA, 2000	To compare the effects of AOs and drug hot spots on rates of violence. An ecological study design was employed, using a sample of 439 census tracts	It was found that socio-cultural variables accounted for 40% of the variability in violent crimes. In a model where socio-cultural variables and drug-related crimes were present, AOD did not represent a significant account of the variability in violent crimes. The model with drug crime density explained 72% of the variance in violent crimes, whereas the model with AODs explained 46% of the variance in violent crime rates. It was found that off-sale alcohol density was much more strongly correlated with violent crimes than on-sale ADs Limitations of the study included the fact that information of violent crimes all came from the same place and alcohol-related crime was not looked at specifically as information was unavailable. Furthermore, attractors of violence were not analyzed such as late night businesses. Because a large city was used, a greater rate of violent crime was found and this may not be able to generalize to smaller locations

(Gruenewald *et al*., 2006); CA, USA, 2000	Cross-sectional data on hospital discharges for violent assaults were obtained for residents of 1637 zip code areas in CA. Assault rates were related to measures of population and place characteristics using spatial statistical models corrected for spatial autocorrelated error	(C) Rates of assault were related to population and place characteristics within zip code areas, and with characteristics of populations living in adjacent zip code areas. Assault rates were related significantly to local densities of off-premise alcohol retail establishments, not bars. However, densities of bars substantially moderated the effects related to local population characteristics. Bars were related significantly to violence in unstable poor minority areas and in rural middle-income areas of the state
(Scribner *et al*., 2000); NO, USA	Analyzed 2604 telephone surveys within 24 census tracts stratified by poverty status and AOD. Distance to AO, age, sex, race/ethnicity and level of education were entered as individual level covariates, and their corresponding aggregated means were entered as census tract level covariates (i.e. mean distance to outlets, mean age, percentage M, percentage Black, mean education). HLM alcohol consumption, drinking norms, drinking attitudes, social acceptability, exposure to AO, socio-demographics	(A) Analysis of variance revealed that 16.2% of the variance in drinking norms and 11.5% of the variance in alcohol consumption were accounted for at the census tract level. In multivariate hierarchical analysis, individual distance to the closest AO was unrelated with drinking norms and alcohol consumption, whereas the mean distance to the closest AO demonstrated a negative relation with drinking norms ($ß_e = -5.50 \pm 2.37$) and with alcohol consumption ($ß_e = -0.477 \pm 0.195$); that is, the higher the mean distance to the closest AO, the lower the mean drinking norms score and mean level of alcohol consumption The findings suggest that the effect of AOD on alcohol-related outcomes functions through an effect at the neighborhood-level rather than at the individual-level. Problem drinkers tend to be grouped in neighborhoods, an effect predicted by AOD
(Zhu *et al*., 2004); TX, USA, 2000.	Using multivariate regression and geospatial analyses, the relationship between AOD and violent crime was investigated. 188 census tracts in Austin, Texas, and 263 in San Antonio, Texas, with information drawn from archival sources	(C) The final model (with adding AOD) explained 71% of the variance in violent crime in Austin and 56% in San Antonio, after controlling for socio-structural features The issues of alcohol availability and access are fundamental to the prevention of alcohol-related crimes within communities
(Scribner *et al*., 2008); 32 colleges and universities in the USA, 2000–2004	Objective: To examine the relationship between the physical availability of off-campus alcohol and drinking outcomes among college students. A multilevel analysis of students ($N = 17{,}051$) residing on campus ($N = 32$) was conducted. Four problem-drinking-related outcomes: average number of drinks when partying, frequency of drunkenness in the past 2 weeks, 30-day frequency of drinking and greatest number of drinks in one sitting; individual level covariates of drinking were introduced at the student level. The number of on- and off-premise AO within 3 miles of campus per 1000 enrolled students	(A) Higher densities of on-premise AO strongly related to drinking outcomes, remaining after controlling for individual predictors of college drinking. The association indicated that the campus means for the average number of drinks when partying and the number of drinking occasions in the past 30 days were, respectively, 1.13 drinks and 1.32 occasions greater when the AOD was two SDs higher Off-campus, on-premise AOD is strongly associated with college-drinking outcomes. Given the limited number of modifiable factors that affect college drinking, on-premise AOD represents a potential modifiable means of addressing the problem
(Livingston, 2008a); Australia, 2001	Cross-sectional data on police reported assaults, AO and socio-demographic characteristics were used to construct a series of models to test the relationship between AOD and assault. Four relationships were examined: a normal linear relationship between AOD and assault, a non-linear relationship with potential threshold or saturation densities, a relationship mediated by the socio-economic status of the neighborhood and a relationship that takes into account the effects of outlets in surrounding neighborhoods	(C) A significant relationship between AOD and assault rates was found An increasing accelerating effect for the density of hotel (pub) licenses was found, suggesting a plausible upper limit for these licenses. The ongoing liberalization of the liquor licensing policy in Australia has the potential to give rise to increasing public health problems and public order
(Huckle *et al*., 2008); New Zealand, 2001–2005	Examined the relationship between physical, socio-economic and social environments and alcohol consumption patterns of drinkers aged 12–17 years. A random telephone survey. Multi-level modeling was used to predict typical-occasion quantity, frequency of drinking and drunkenness, using AOD as a predictive factor. A sample of 1179 teenagers, and AOD determined for 8628 census meshblocks	(A) AOD was associated with typical occasion quantity and approached significance for frequency of drunkenness. Frequency of supply was also a significant predictor of all drinking measures, as was ethnic status Living within 10 min drive of relatively more outlets was associated with larger quantities of alcohol consumed by underage drinkers, making it an area of considerable importance from a public health perspective

(*continued overleaf*)

Table 1. (Continued)

Study; place and year of study	Design/sample of the study and main indicators	Findings: (A) drinking levels; (B) drinking patterns; (C) damage; and Policy implications and comments
(Donnelly *et al.*, 2006); Australia, 2002	A secondary analysis of the National Crime and Safety Survey was conducted using data from 9300 survey participants from New South Wales, to investigate the relationship between AOD and perceptions of alcohol-related problems	(B and C) Multi-level modeling revealed that respondents, who lived closer to alcohol outlets and in high-density areas, were more likely to report problems in their neighborhood from drunkenness to property damage The potential impact of higher concentrations of AO on the well-being of a community should force policy makers to restrict the number of licenses granted
(Kuntsche and Kuendig, 2005); Switzerland, 2002	Aim: to investigate the relationship between AOD, perception of adolescent drinking in public (both assessed at the school level), and adolescent drinking and drunkenness at individual level. Hierarchical linear regression models were calculated based on data from 1194 ninth graders in Switzerland (mean age = 15.3, SD = 0.7) and their schoolmasters ($n = 61$). Frequency of adolescent alcohol use; frequency of lifetime drunkenness; AOD; perception of adolescents drinking in public	(A) Apart from the positive main effects, the results reveal a negative interaction of AOD and the perception of adolescent drinking in public in predicting individual alcohol use among adolescents. In regions with a high AOD, it appears that the schoolmasters' perception reflects the general drinking norm of the surrounding local area rather than the actual adolescent drinking level More research is needed, particularly in Europe and among adolescent populations, in order to reach a better understanding of school-level predictors of adolescent alcohol use
(Truong and Sturm, 2007); USA, 2002–2003	Examined the relationships between alcohol environments and excessive alcohol consumption, heavy episodic drinking, driving after drinking and riding with a driver after drinking. Two surveys were utilized ($n = 8167$, $n = 42{,}044$), with the primary explanatory variable being types of outlet locations from the individuals residence	(A) On-sale establishments, particularly minor-restricted establishments, were significantly associated with alcohol consumption and heavy episodic drinking, after controlling for socio-demographics. Off-sale retails were not found to be related to problem drinking Minor restricted establishments that sell alcohol illustrated the highest risk for heavy episodic drinking when located within 1 mile of individuals' residences, although these establishments account for only 6% of licenses. License regulation must be paired with comprehensive measures to solve alcohol-related problems
(Livingston *et al.*, 2008); Australia, 2003–2004	Examined individual and community level correlates of regular very high-risk drinking (>20 drinks for M and >11 for W, at least monthly) among young (16–24) drinkers, using a CATI survey of 10,879 participants	(A) One-fifth reported regular high-risk drinking. AOD was seen as a significant community-level correlate, associated with the increased prevalence of high-risk drinking Regulatory management of retail outlets should be a priority, and an ongoing focus on early intervention and prevention of alcohol is required
(Schonlau *et al.*, 2008); USA, 2004–2005	Alcohol consumption information was collected through a telephone survey of 2881 households geo-coded by neighborhood (both in LA County and Louisiana) and individual and was used to assess the relationship between alcohol availability as measured by the density of off-premise AOs and alcohol consumption	(A) AOD was not associated with the percentage of respondents who were drinkers in either site. AOD was associated with the quantity of consumption among drinkers in Louisiana but not in LA. AOD within a one-mile buffer of the respondent's home was more strongly associated with alcohol consumption than AOD in the respondent's census tract The relationship between AOD and drinking behaviors is complex and may vary due to differences in the neighborhood design and travel patterns
(Theall *et al.*, 2008), CA and Louisiana, USA, 2004–2005	A hierarchical model was employed to examine whether AOD is associated with reduced social capital and whether this relationship is mediated by perceived neighborhood safety. $N = 2881$ from 217 census tracts	Neighborhood off-premise AOD was strongly associated with reduced social capital, and the relationship between collective efficacy and AOD appears to be mediated by perceived neighborhood safety AOD may hinder the development of social capital

M, men; W, women; AO, alcohol outlet(s); AOD, alcohol outlet density; HLM, hierarchical linear modeling; STD, sexually transmitted diseases; SD, standard deviation.

Table 2. Recent studies (2000–2008) on the impact of hours and days of sale on alcohol consumption, drinking patterns and damage

Study; place and year of study	Design/sample of study and main indicators; interventions	Findings: (A) drinking levels; (B) drinking patterns; (C) damage; and Policy implications and comments
(Chikritzhs and Stockwell, 2006); Perth, Western Australia, 1990–1997	Examined the impact of later trading hours for licensed hotels on levels of associated impaired driver road crashes and drivers' breath alcohol levels, using police data for impaired drivers involved in road crashes. Time-series analyses using multiple linear regressions were applied to determine the influence of an Extended Trading Permit (ETP); later trading hours for licensed 'hotels'	(C) Later trading levels corresponded with a significant increase in monthly crash rates. No relation was found between drivers' breath alcohol levels and ETPs The authors found that extended trading hours were consistent with increased levels of impaired driver road crashed and alcohol consumption. This may be an indication of characteristics specific to clientele of hotels who applied for the ETP
(McMillan and Lapham, 2006); NM, USA, 1990–2000	The ARC and ARC fatality data were modeled using the classic decomposition of time series into trend and seasonal components and testing for temporal autocorrelation in the residuals. Generalized linear models and Poisson regression models were used; study determined the relative risk of alcohol-related motor-vehicle accidents and fatalities after New Mexico lifted its ban on Sunday packaged alcohol sales	(C) 29% increase in alcohol-related crashes and a 42% increase in ARC fatalities on Sundays after the ban on Sunday packaged alcohol sales was lifted. There was an estimated excess of 543.1 alcohol-related crashes and 41.6 ARC fatalities on Sundays after the ban was lifted Repealing the ban on Sunday packaged AS introduced a public health and safety hazard in New Mexico. State legislators should consider these consequences when deciding on a policy that is intended to serve the public well-being
(McMillan *et al*., 2007); NM, USA, 1990–2000	The goal of this study was to measure county-level variability in changes in ARC rates, while adjusting for county socio-demographic characteristics, spatial patterns in crash rates and temporal trends in ARC rates. Bayesian hierarchical binomial regression models ARC rate, socio-demographic characteristics; legalized Sunday packaged alcohol sales	(C) Results show marked variability in the impact of legalized Sunday packaged AS on ARC rates. Relative risks of an ARC for the post-repeal versus pre-repeal period vary across counties, from 1.04 to 1.90. Counties with an older population suffered a greater negative impact of legalized Sunday packaged alcohol sales. Counties with communities that quickly passed the local option to re-ban packaged sales on Sundays were able to mitigate most of the deleterious impact that increased alcohol availability had, across the state The current study shows that this impact varies considerably across counties in New Mexico. Furthermore, the negative impact of legalized Sunday packaged alcohol sales appear to have been mitigated in counties with large communities that quickly held an election to reinstitute the ban
(Chikritzhs and Stockwell, 2002); Perth, Australia, mid-1991 to mid-1997	Examined the impact of later trading hours for licensed hotels ('hotels') on levels of violent assault on or near these premises. Levels of alcohol purchases were also examined. A time-series analysis, employing linear regression assault rates; later trading hours for licensed hotels ('hotels')	(C) There was a significant increase in monthly assault rates for hotels with late trading following the introduction of extended trading permits. This relationship was largely accounted for by higher volumes of high alcohol content beer, wine and distilled spirits purchased by late trading hotels It is suggested that greater numbers of patrons and increased levels of intoxication contributed to the observed increase in violence and that systematic planning and evaluation of late trading licenses are required
(Vingilis *et al*., 2005); Ontario, Canada, New York and Michigan, 1992–1998	The purpose of the study was to evaluate the road safety impact of extended drinking hours in Ontario, with a quasi-experimental design, using interrupted time series with a non-equivalent non-intervention control group to assess changes in the volume of AS in Ontario between 1989 and 1999. Total and alcohol-related monthly traffic fatalities for specific nights of the week for Ontario and compared to neighboring regions of New York and Michigan; on 1 May 1996, Ontario, Canada, amended the Liquor License Act to extend the hours of AS and service in licensed establishments from 1 am to 2 am	(A) The volume of sales in thousands of liters of beer, wine and spirits and per capita 15 years of age and over for Ontario were subjected to time-series analyses. The trends indicate that consumption of beer decreased between 1994 and 1998, while the consumption of wine and spirits decreased in the early 1990s and increased in the late 1990s (C) The blood alcohol concentration positive driver fatality trends reflected downward trends for Sunday–Wednesday 12–2 am and Thursday–Saturday 1–2 am for Ontario and downward trends for Thursday–Saturday 12–1 am and 2–3 am for New York and Michigan after the extended drinking hour policy change. Ontario total fatality data show similar movements in blood alcohol positive trends The multiple datasets converge in suggesting little impact on BAC positive fatalities with the extension of the closing hours by 1 h. These observations are consistent with other studies of small changes in access to alcohol availability. Also, many licensed establishments choose not to change their hours of closing. It is also possible that drinking and driving rates were deflated during this time due to a number of concurrent road safety initiatives

(*continued overleaf*)

Table 2. (Continued)

Study; place and year of study	Design/sample of the study and main indicators	Findings: (A) drinking levels; (B) drinking patterns; (C) damage; and Policy implications and comments
(Vingilis *et al*., 2006); Windsor, Ontario and Detroit, Michigan, 1992–1999	The design involved a comparison of the city-regions of Windsor, Ontario, and Detroit, Michigan, with a 2 am closing time, and Ontario and Michigan monthly motor vehicle casualties (major injuries and fatalities) occurring between 11 pm and 3 am for 4 years pre- and 3 years post-policy change for two city regions and Ontario and Michigan; on 1 May 1996, Ontario, Canada, amended the Liquor Licence Act to extend the hours of AS and service in licensed establishments from 1 am to 2 am	(C) In the Windsor region, a significant increase was found for alcohol-related motor vehicle casualties after the drinking hours were extended. However, the Detroit region showed a statistically significant decrease in alcohol-related motor vehicle casualties concomitant with Ontario's drinking hour extension. A significant decrease was found for injury collisions involving vehicles with Ontario license plates in the Detroit region In areas with high densities of licensed establishments, competition may motivate licensed establishments to extend their hours of sale. One aim of the policy to extend the selling hours of licensed premises was to reduce the number of patrons who cross the border when Ontario's bars and restaurants close. This may have been achieved, but this consequence appears to be an increase in alcohol-related motor vehicle casualties in the Windsor area
(Vingilis *et al*., 2007); Ontario, Canada, 1992–1999	To evaluate the impact of extended drinking hours in Ontario on motor-vehicle collision (MVC) and other injuries admitted to regional trauma units based on Ontario Trauma Registry data. A quasi-experimental design using interrupted time series. Monthly data on number of admissions from MVC and other causes of injury during the 11 pm–12 am, 12–1 am, 1–2 am, and 2–3 am time windows for 4 years before and 3 years after the policy change (May 1992–April 1999); extended hours of sale for licensed premises in Ontario, from 1 am to 2 am	(C) Increased availability of alcohol as a result of extension of closing hours had an impact on non-MVC injuries presented to Ontario trauma units, but road safety initiatives may have mediated the effects of the extension on MVC injuries These observations are consistent with those of other studies that have investigated small changes in alcohol availability
(Chikritzhs and Stockwell, 2007); Perth, Australia, 1993–1997	The purpose of the study was to determine if extending trading permits in AO influenced impaired driver breath alcohol levels. Forty-three hotels were allowed later closing hours and 130 continued with the same hours and provided controls for the study. Information was obtained through police records subsequent to the lowering of the legal breath alcohol levels (BAL) limit from 0.08 mg/mL to 0.05 mg/mL in 1993 that may have changed driver consumption. Start dates of when AO were given permits for longer hours were recorded and controls were given random start dates for longer hours to maintain control groups; ETPs for licensed hotels. Control groups were randomly given start dates for extended hours in order to be comparable to hotels in which extended hours were in effect throughout the entire study	(A) Before hours were extended, hotels that were to be extended in hours purchased much less low/mid-strength alcohol content beer, wine and spirits, but similar quantities of regular content. Hotels with extended hours were more likely to have younger crowds and more likely to be W. Having extended hours at a hotel was more likely to lead to lower BAL in W but not M (showed greater levels of breath alcohol) as measured by arrests It was believed that extended hours in hotels was related to W pacing themselves in drinking and leaving bars at least 1 h before closing time. However, it may be that fewer M were caught because there is less police patrol during the week hours of the morning. A limitation of the study may be reports of where the person last drank may be inaccurate and confound results
(Norström and Skog, 2005); Sweden, 1995–2002	Whether the increased AS spurred by the Saturday opening also led to increased rates of alcohol-related harm. The pre-intervention period covered the time period January 1995–January 2000, phase I of the post-intervention period February 2000–June 2001 (17 months), and phase II July 2001–July 2002 (13 months). Prior to Feb 2000, all alcohol monopoly outlets were closed on Saturdays. After this date, stores in an experimental area (six counties) were open on Saturdays. In the control area (seven counties), the shops remained closed. To prevent biases due to trade leakage, the experimental and control areas were separated by a buffer area (seven counties). Since continuous evaluations of the trial did not reveal any negative consequences, the Saturday opening was implemented in the whole of Sweden after 17 months. The effects of the two phases were estimated through analyses of monthly data depicting how sales and harm rates evolved in the experimental area compared to the control area during phases I and II; the extension of the Saturday opening of the alcohol monopoly shops from an experimental area to the whole of Sweden	(A) Observed: statistically significant increase in alcohol sales of 3.7% during phase I, with approximately the same increase during phase II (3.6%). (C) There were no significant changes in any of the assault indicators, neither during phase I nor during phase II. There was a statistically significant increase in drunk driving (12%) during phase I, but no change during phase II The analyses suggested that the increase during phase I was mainly due to a change in the surveillance strategy of the police. Authors could not detect any increase in alcohol-related harm due to insufficient statistical power or other methodological complications that were highlighted in the study

(Duailibi *et al*., 2007); Diadema, Brazil, 1995–2005	This study investigated whether limiting the hours of alcoholic beverage sales in bars had an effect on homicides and violence against W in the Brazilian city of Diadema (population 360,000). Log-linear regression analyses; data on homicides (1995–2005), violence against W (2000–2005); the policy to restrict AS was introduced in July 2002 and prohibited on-premise AS after 11 pm	(C) The new restriction on drinking hours led to a decrease of almost nine murders per month. Assaults against W also decreased, but this effect was not significant in models in which underlying trends were controlled Restricting access to alcohol can reduce alcohol-related problems. Results did not provide any support to the converse view, that increasing availability will somehow reduce problems
(Lange and Voas, 2000); Mexico, 1997–1998	Anonymous and voluntary breath-test surveys, conducted over a 1-year period, were administered to 5112 boarder crossers, age 18+, between 12 am and 4 am, at the San Diego, CA, and Tijuana, Mexico, boarder; the passage in 1994 of the youth-orientated zero-tolerance driving law in California; accompanied by the weakly enforced age-18 law and low liquor costs	(A) The percentage of crossers with BACs >0.08 were 36.88% and 48.74%, for crossers between the ages of 18 and 20, and 21 and 25, respectively
(Hough and Hunter, 2008); UK, 2005	The aim was to liberalize the rigid system while reducing the problems associated with rapid heavy drinking occurring at a standardized closing time. Qualitative interviews were conducted with 105 business owners; The Licensing Act 2003, coming into force in Nov 2005, abolished set licensing hours for pubs and clubs	(A) Alcohol consumption showed a slight fall. Customers were reported as coming out later, with peak hours being pushed back. (C) No obvious impact on crime or violence While the majority of pubs extended their hours, most of these extensions were short
(Newton *et al*., 2007); London, UK, 2005–2006	Measured the impact of new licensing laws, which permitted 24 h alcohol trading by assessing any changes in overnight attendances at the emergency department. The authors investigated 2736 patients, 16+ years, who attended in March 2005 (prior to the new licensing laws) and compared these figures to 3135 patients who attended in March 2006 (after the introduction of the new licensing laws). The attendances were examined to determine the extent to which they were related to alcohol intoxication; changes to UK licensing laws, which permitted 24-h alcohol trading	(C) Of the overnight attendances in March 2005, 2.9% were classified as alcohol related, while in March 2006, 8.0% were classified as alcohol related. The proportion of alcohol related assaults resulting in overnight hospitalization went from 0.99% of all overnight attendances in 2005 to 1.98% in 2006; alcohol-related injuries increased from 1.61% in 2005 to 4.11% in 2006; and alcohol-related hospital admissions went from 0.88% in 2005 to 2.46% in 2006 These findings could be used to make representations to liquor licensing authorities concerning applications for extensions of trading hours
(Briscoe and Donnelly, 2003); Sydney, Australia, July 1998–June 2000	This study examines the distribution of harmful outcomes across licensed premises in three inner-urban areas of NSW. Police-recorded assault incidents on licensed premises in inner Sydney, Newcastle and Wollongong over a 2-year period were analyzed	(C) In inner Sydney, 12% of hotels and nightclubs accounted for almost 60% of all assaults at hotels and nightclubs, in inner Newcastle 8% of licensed premises accounted for nearly 80% of all assaults on licensed premises and in inner Wollongong 6% of licensed premises accounted for 67% of all on-premise assaults. The analysis also found that assault incidents on licensed premises were concentrated late at night or early in the morning and on weekends. Licence types identified as being the most problematic for violence on licensed premises were hotels and nightclubs. In particular, hotels with extended or 24-h trading recorded a greater number of assaults compared with those trading standard hours. Of all assaults on licensed premises in inner Sydney, 56% were reported to occur between 12 am–3 am and 3 am–6 am
(Ragnarsdottir *et al*., 2002); Reykjavik, Iceland, 1999–2000	The city council of Reykjavik decided to initiate an experiment with unrestricted alcohol-serving hours at bars and restaurants. The consequences were evaluated in terms of crowds gathering in streets and bars in the city center and the workload of the police as well as the professionals at the emergency ward during weekend-nights	The number of calls or work-tasks in the city center rose in number from 251 in 1999 to 286 in 2000 (14%). The total number of cases admitted to ER during the weekend-nights increased by 31%. The number of cases admitted to ER on Saturdays and Sundays rose by 20% but decreased by 2% during other weekdays. The numbers of cases of suspected drunk driving rose remarkably from 29 in 1999 to 52 in 2000 (80%)

ARC, alcohol-related crash; AS, alcohol sales; AO, alcohol outlet; BACs, blood alcohol concentrations; M, men; W, women.

(Gruenewald *et al.*, 2002; Weitzman *et al.*, 2003; Trolldal, 2005a; Kypri *et al.*, 2008), but most examined one or the other. In 13 studies, drinking patterns or consumption was examined and in 36 studies, damage from alcohol was the main focus or indirect focus. This distribution, strongly oriented toward damage variables, might reflect a combination of factors: interest of the investigator, funding, access to data and perception that damage is more conceptually interesting or politically powerful than findings on alcohol density and drinking levels or patterns of drinking. The results on alcohol consumption and drinking patterns are discussed together below.

Impact on alcohol consumption and drinking patterns. Most of these studies were cross-sectional in design, with several using time-series methodology—focusing on Norway (Norström, 2000) and Canada (Trolldal, 2005a, 2005b). The setting for most of the studies was the USA, and there were several from other jurisdictions that considered alcohol consumption and/or drinking patterns: Australia (Livingston, 2008b), New Zealand (Huckle *et al.*, 2008) and Switzerland (Kuntsche and Kuendig, 2005).

Several over-arching findings emerged with regard to alcohol consumption and outlet density. AOD was associated with a higher overall consumption in the jurisdiction (Trolldal, 2005b), frequency of drinking (Gruenewald *et al.*, 2002; Weitzman *et al.*, 2003), as well as college campus means for the average number of drinks when partying (Scribner *et al.*, 2008). A study of two US jurisdictions reported that high AOD was associated with the quantity consumed among drinkers in Louisiana, but not in Los Angeles County (Schonlau *et al.*, 2008). One study found that in regions of Switzerland with high AOD, the schoolmasters' perception reflected the general drinking norm of the surrounding area, rather than the actual adolescent drinking level (Kuntsche and Kuendig, 2005).

There is some variation in the findings on drinking patterns. A California-based study (Pollack *et al.*, 2005) reported dramatic differences in that the most deprived neighbourhoods had higher levels of AOD than the least deprived. Nevertheless, alcohol availability was not associated with heavy drinking in this study. In contrast, a US college-based study reported a significant correlation between high AOD and high-risk drinking—consuming 5+ drinks at an off-premise party. This relationship was held for sub-groups of drinkers (Weitzman *et al.*, 2003). Another US campus-based study found that high on-premise AOD was strongly related to the average number of drinks consumed while partying and the number of drinking occasions in the past 30 years (Scribner *et al.*, 2008). A study in New Zealand reported that AOD was associated with a typical quantity and approached significance with regard to frequency of drunkenness (Huckle *et al.*, 2008).

Impact on alcohol-related problems. Recent studies of alcohol density have examined a range of dependent variables, including high-risk drinking, problem drinking levels, drinking and driving incidents, traffic crashes, pedestrian casualties, assaults and other types of violence, sexually transmitted disease and suicide. Here also the most common design was cross-sectional. Time-series analysis is reported in two studies (Norström, 2000; Trolldal, 2005a) and several others used panel model analysis (Treno *et al.*, 2007), longitudinal data (Gruenewald and Remer, 2006) or hierarchical model (Yu *et al.*, 2008). The summary details on these 36 studies are found in Table 1, and some illustrative results are presented below, rather than a study-by-study commentary. A general finding is that whether there are a few studies, or even one, or a number, with focus on a specific 'dependent variable', higher AOD tends to be associated with higher rates of damage, harm or problems.

These problems included, for example, alcohol-involved pedestrian collisions (LaScala *et al.*, 2001), self-reported injuries (Treno *et al.*, 2001) and suicide, alcohol-related crashes and alcohol-related crash fatalities (Escobedo and Oritz, 2002). In a longitudinal study, authors report that changes in outlet densities over time were directly related to traffic injury rates requiring hospitalization and that may or may not involve alcohol, and to crash rates where the incident was suspected by the police to have involved alcohol (Treno *et al.*, 2007).

A natural experiment study by Cohen and colleagues focused on the civil unrest in Los Angeles in 1992 and the destruction of liquor outlets; they found that a decrease in the number of alcohol outlets per mile of roadway was associated with 21 fewer cases of gonorrhea cases per 100,000 in tracks affected by the civil unrest, compared to those not affected (Cohen *et al.*, 2006). Another focus in this literature is child abuse or neglect: Freisthler and colleagues (Freisthler *et al.*, 2004) report that the number of bars per 1000 was positively related to the rate of physical abuse of children, and that the number of bars per 1000 was positively related with the occurrence of substantial neglect, or higher rates of child maltreatment cases (see Freisthler *et al.*, 2007).

There were a number of studies that focused, specifically, on violence and AOD. For example, Gorman and colleagues found a strong association between alcohol outlets and violent crime (Gorman *et al.*, 2001). A longitudinal study by Yu and colleagues examined the relationship between civil unrest in Los Angeles in 1992, closure of alcohol outlets and crime, and these authors found that on average those census tracks that experienced more alcohol outlet closures experienced more dramatic decreases in assault rates since the closures (Yu *et al.*, 2008). McKinney and colleagues projected that an increase in 10 outlets per 10,000 population increased the risk of male-to-female partner violence by 34% and female-to-male partner violence by 12% (McKinney *et al.*, 2009).

Similar findings were reported in a longitudinal study by Gruenewald and Remer who found that an increase in the number of licensed alcohol retail establishments, especially bars and off-premise outlets, was related to an increase in violent assaults and overnight stays in a hospital (Gruenewald and Remer, 2006). They also reported that a 10% increase in the number of off-premise outlets and bars was related to increases of 1.67% and 2.06% in violence rates across local and lagged spatial areas, respectively. Every six outlets accounted for one additional violent assault that resulted in at least one overnight stay at a hospital. These effects increased with larger male populations, and were, specifically, found to double with every 3% increase in the percentage of males.

Violence was a central focus of a longitudinal study by Norström that considered 30 years of data from Norway, 1960–1995, and used police data on crimes of violence and AOD as the number of public drinking places per 10,000 inhabitants aged 15 and older, and time-series analysis techniques (Norström, 2000). This study found a positive relationship with borderline significance, between AOD and crimes of violence investigated by the police, and thus replicated findings that were reported in a number of cross-sectional studies.

Finally, a recent review complements the main aforementioned findings by expanding on some of the implications and proceeds to offer topics for future research (Livingston *et al*., 2007). These authors hypothesize that the effects of AOD can be separated conceptually into: '(i) a proximity effect (how easily one can access alcohol); and (ii) an amenity effect (how outlets influence the quality and characteristics of surrounds within the local community)' (Livingston *et al*., 2007, p. 561).

While both have implications for alcohol-related damage and prevention of the same, the authors point out that much of the outcome focus of the research on density has been on the first effect. They note that increased AOD has been shown to increase consumption and alcohol-related problems, and may also have a second effect; 'each new outlet potentially increases the competitive pressures on existing outlets, which may result in price reductions that tend to lead to increased levels of consumption' (Livingston *et al*., 2007, p. 561; see also Babor *et al*. (2003)).

The amenity effects relate to the negative impacts of licensed premises on their neighbourhood. The negative consequences can include violence, street disturbances and other social problems. Licensed premises may be seen as attractors of trouble, and a bunch of alcohol outlets in the same district 'often results from crowds of young people, in various stages of intoxication, moving between outlets or spilling out onto the streets at closing time' (Livingston *et al*., 2007, p. 561). Even if there is not a substantial increase in the density of outlets in an area, alcohol outlets can be linked to a high level or an increase in alcohol-related problems. For example, this may be the case if the licensed premises are bunched together, practice ineffective screening for legal age and level of intoxication of patrons when they enter, or are served, encourage over-service or heavy consumption through lax server intervention practices, using discount pricing to stay competitive, and are attractive to those who wish to participate in violent and other disruptive behaviors.

Hours and days of sale

The 15 studies that examined the impact of hours and days of sale are summarized in Table 2.

The majority focuses on damage from alcohol, and also commonly includes information on overall consumption. Within the scope of our systematic review, there are currently no studies that provide information on drinking patterns. While all of the studies did not necessarily focus exclusively on licensed premises, the economic and availability principles that underlie these general findings apply to a wide range of types of outlets, including licensed premises.

Impact on overall alcohol consumption. An Australian study (Chikritzhs and Stockwell, 2002) found that higher volumes of high alcohol content beer, wine and distilled spirits were purchased in the licensed hotels during late trading hours. Extended hours were also associated with young crowds, more likely to be women, and lower blood alcohol levels among women but not men (Chikritzhs and Stockwell, 2007).

A study based in Sweden examined the impact of two changes in trading days, from an experimental area to the whole of Sweden, between 1995 and 2002 (Norström and Skog, 2005). This involved Saturday openings of alcohol monopoly outlets. The authors found a statistically significant increase in alcohol sales in both phases, 3.7% during phase I and 3.6% during phase II—the two post-intervention periods.

Impact on damage from alcohol. Several studies, based on natural experiments, have assessed the impact of changes in either the days of sale or the hours of sale on drinking-related damage. Those studies that focused on days of sale are examined first.

An Ontario study examined the impact of the Liquor Licence Act to extend the hours of alcohol sales and services in licensed establishments from 1 am to 2 am, and focused on the period 1992–1999 (e.g. Vingilis *et al*., 2007). Their analyses include provincial-to-state and city-to-city comparisons, from which several findings emerged. The authors found that the extension of closing hours had an impact on non-motor vehicle injuries presented at Ontario trauma units, but road safety initiatives occurring at approximately the same time may have mediated the effects of the extension on motor vehicle collision injuries (Vingilis *et al*., 2007). Also, an analysis of several converging data sets suggested that there was little impact on the blood alcohol concentration (BAC)-positive fatalities with the extension of closing hours, a finding that they found was consistent with other studies of small changes in alcohol availability (Vingilis *et al*., 2005). However, when the authors looked at the adjacent cities of Windsor and Detroit, they detected a cross-border impact. A significant increase in alcohol-related motor casualties was found in the Windsor region and concurrently, significant decreases in the total and alcohol-related motor vehicle casualties were found in the Detroit region, after the closing hours of licensed premises were extended in Ontario, which includes the City of Windsor. A significant decrease was found for collisions involving vehicles with Ontario license plates in the Detroit region (Vingilis *et al*., 2006). A reasonable explanation is that prior to the change in policy, some of the drinkers who would go to Detroit after the licensed premises closed in Windsor were now staying in the Windsor area. Thus, it appears that for some parts of Ontario, the increase in access to alcohol contributed to an increase in drinking-related problems.

The Australian study presented above found that following the introduction of extended trading hour permits, there was a significant increase in monthly assault rates for hotels with late trading hours and this relationship was largely accounted for by the higher volumes of alcohol sales (Chikritzhs and Stockwell, 2002). A subsequent study found that later trading hours corresponded with a significant increase in monthly crash rates (Chikritzhs and Stockwell, 2006).

Two studies focusing on changes in closing time in the UK were found. The Licensing Act of 2003, which came into effect in November 2005, abolished closing hours for alcohol pubs and clubs, and also permitted 24 h trading—including off-premise or package venues. Focusing on pubs, Hough and Hunter reported on the results of qualitative interviews with 105 business owners: a slight fall in alcohol consumption was reported by respondents, and they indicated that customers were coming out later with peak hours being pushed back, but no obvious impact on crime or violence was noted (Hough and Hunter, 2008).

In contrast, Newton reports on a cohort study, focusing on an increase in alcohol-related hospital attendees between 2005 and 2006 (before and after implementation of the licensing act) (Newton *et al*., 2007). The proportion of alcohol-related assaults, which resulted in overnight hospitalization went from

a total of 0.99% to 1.98%, alcohol-related injuries went from 1.6% to 4.1% and alcohol-related hospital admissions went from 0.88% to 2.46%.

Several studies examine days of sale. In their investigation of the phased introduction of Saturday openings' of government liquor stores in Sweden, Norström and Skog did not find significant changes in assault indicators during either of the two post-intervention phases. However, a significant increase in drunk driving (by 12%) was detected during phase I, with no change during the second phase (Norström and Skog, 2005).

A study based on the state of New Mexico examined the impact of allowing package sales (off-premise) on Sundays, focusing on 1990 to 2000 (McMillan and Lapham, 2006; McMillan *et al*., 2007). Several findings emerged from this analysis. Specifically, there was an estimated excess of ∼543 alcohol-related crashes and 42 alcohol-related crash fatalities per year, after the ban was lifted. There was marked variability in the impact of legalized Sunday packaged alcohol sales on alcohol-related crash rates. For example, the relative risks vary across counties, ranging from 1.04 to 1.90. Counties and communities that quickly passed the local option to re-ban packaged sales on Sundays were able to mitigate most of the deleterious impact that was associated with the increase in alcohol availability, which was observed across the state.

Finally, a study focusing on the Brazilian city of Diadema, investigated whether limiting the hours of alcoholic beverage sales in bars had an effect on homicides and violence (Duailibi *et al*., 2007). Using the time-series analysis, the investigators found that restrictions on drinking hours led to a dramatic decrease in murders and assaults against women, specifically (Duailibi *et al*., 2007).

INTERPRETATIONS AND IMPLICATIONS

The studies summarized in this paper reflect a range of methods and data resources, including archival data on alcohol sales and AOD, mortality and morbidity statistics, and survey data. In some studies, a cross-sectional design is evident, while others employ a longitudinal design. There are some that involve a quasi-experimental design, such as data collected before and after an intervention, or use a comparison site or population.

Several caveats should be noted. Those with a cross-sectional design provide noteworthy findings with regard to associations between key variables, but they cannot provide a clear answer about the causal linkage or causal direction. For example, if in a cross-sectional study, alcohol consumption rates or prevalence of drinking-related problems are found to be higher in jurisdiction with a higher density of outlets, compared to those areas with a lower density, it could be that higher density stimulated an increase in alcohol consumption, or that high consumption stimulated a receptivity to more alcohol outlets and subsequent growth in density, or that both alcohol consumption and density of outlets are influenced by other factors. However, as noted in the study by Weitzman and colleagues (2003), summarized above, although it is difficult to determine the chronological order of supply and demand patterns, it is unlikely that supply, e.g. higher density of outlets, fully followed demand. In their case, both high levels of heavy episodic or binge drinking and patterns of bar and AOD had been in place for several years.

Second, the majority of these studies focus on one intervention or 'independent' variable. However, in reality, modifications in how alcohol is managed may involve concurrent or partially overlapping changes—increased marketing, lower real prices, longer hours and so on. This creates complications for isolating the impact of specific variables and interpreting the results. For example, the privatization of alcohol retailing in the province of Alberta in 1993 (Trolldal, 2005a) involved a number of concurrent or overlapping changes, such as an increase in the density of outlets, longer hours of sale, increase in the average price of higher-volume lower-priced brands and decrease in the price of higher-priced brands.

Our analysis focused on publications between 2000 and 2008. The over-arching findings are in line with earlier work on these topics as summarized in Edwards *et al*. (1994), Holder and Edwards (1995) and Babor *et al*. (2003). Furthermore, two recent publications found associations between availability of alcohol and violence among US partners (McKinney *et al*., 2009) and between AOD and adolescent deviance (Freisthler *et al*., 2009), which is not unexpected given the main findings from the research literature analysed in this paper. A recent publication by Stockwell and Chikritzhs (2009) noted that 11 of 14 peer reviewed papers with baseline and control measures found adverse effects from increased hours or benefits from reduced hours.

The studies from 2000 to 2008, summarized above, generally support the conclusions drawn by Babor and colleagues (2003) and Stockwell (2006) and also earlier work (Edwards *et al*., 1994; Holder and Edwards, 1995). Babor and colleagues classified price and taxation controls, controls on hours and days of sale, and controls on AOD as being shown to be effective (Babor *et al*., 2003). Their conclusions were based on more than a few studies and on research in several cultural settings. These interventions were among the 'top 10' interventions identified by Babor and colleagues (2003) and the findings summarized in this paper support this conclusion.

It is noteworthy that density of outlets variable and changes in hours or days in the sale of alcohol are related to drinking levels and also drinking-related harm. As reflected in the literature in this systematic review, the impact involves a wide range of variables, populations and dimensions, including pedestrians, young children, drivers, assaults, hospitalizations and chronic problems.

It is clear that alcohol management has real consequences; it can stimulate consumption and contribute to an increase in alcohol-related problems or reduce alcohol-related harm. Many problems can be reduced, or partially avoided, through careful planning and a precautionary approach. It is feasible to curtail the rise in alcohol consumption and high-risk drinking, and reduce the damage from alcohol. This will require, at a minimum, three actions: that there be no further initiatives to increase access to alcohol; that the most effective interventions be implemented, reinforced and evaluated; and that health and safety experts become central contributors to policy decisions that impact alcohol management.

In conclusion, the evidence summarized above informs the current deliberations on alcohol policy in many jurisdictions. These include those at the Canadian national level (Canadian Centre on Substance Abuse, 2007), as well as in Nova Scotia (Department of Health Promotion and Protection, 2007) and in British Columbia (Office of the Provincial Health Officer,

2008). The findings of this study are in line with the recommended actions by the WHO (2009), a document that addresses the availability of alcohol, including limits on hours and day of sale and regulations on vendor and alcohol outlet density.

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Effectiveness of Policies Restricting Hours of Alcohol Sales in Preventing Excessive Alcohol Consumption and Related Harms

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Abstract

Local, state, and national policies that limit the hours that alcoholic beverages may be available for sale might be a means of reducing excessive alcohol consumption and related harms. The methods of the *Guide to Community Preventive Services* were used to synthesize scientific evidence on the effectiveness of such policies. All of the studies included in this review assessed the effects of increasing hours of sale in on-premises settings (in which alcoholic beverages are consumed where purchased) in high-income nations. None of the studies was conducted in the U.S. The review team's initial assessment of this evidence suggested that changes of less than 2 hours were unlikely to significantly affect excessive alcohol consumption and related harms; to explore this hypothesis, studies assessing the effects of changing hours of sale by less than 2 hours and by 2 or more hours were assessed separately.

There was sufficient evidence in ten qualifying studies to conclude that increasing hours of sale by 2 or more hours increases alcohol-related harms. Thus, disallowing extensions of hours of alcohol sales by 2 or more should be expected to prevent alcohol-related harms, while policies decreasing hours of sale by 2 hours or more at on-premises alcohol outlets may be an effective strategy for preventing alcohol-related harms. The evidence from six qualifying studies was insufficient to determine whether increasing hours of sale by less than 2 hours increases excessive alcohol consumption and related harms.

Introduction

Excessive alcohol consumption is responsible for approximately 79,000 deaths per year in the U.S., making it the third-leading cause of preventable death.[1] Binge drinking (consuming five or more drinks per occasion for men and four or more drinks per occasion for women) is reported by approximately 15% of U.S. adults aged ≥18 years and by approximately 29% of high school students in the U.S.[2,3] The direct and indirect economic costs of excessive drinking in 1998 were $184.6 billion.[4] The reduction of excessive alcohol

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consumption in general and binge drinking in particular are thus matters of major public health and economic interest. Reducing binge drinking among U.S. adults has been a public health objective in *Healthy People 2010*.[5]

In the U.S., local control of the total or specific hours during which alcoholic beverages may be sold (hereafter referred to as "hours of sale") varies from one state to another. Some states allow cities, counties, and other local jurisdictions to enact their own alcohol control policies, and in these states, restrictions on hours of sale can vary from one location to another. In other states, local control may be pre-empted by state regulations that prohibit local authorities from enacting alcohol control regulations stricter than those that apply to the rest of the state.[6,7] As of 1953, American Indian reservations have the authority to establish their own alcohol-related policies, prior to which alcohol was formally prohibited.[8]

There is also wide variation among states in the specific restrictions they place on the hours of sale by retail setting (i.e., on- or off-premises) and by the day of the week.[9] For on-premises alcohol outlets, states allow facilities to serve alcohol for a median of 19 hours a day on weekdays and Saturdays. Nine states (Alabama, Florida, Georgia, Illinois, Louisiana, Maryland, Nevada, New Jersey, and South Carolina) have no limits on hours of sale for on-premises alcohol outlets.[9] On Sundays, alcohol may be served for a median of 17 hours at on-premises facilities, with seven states placing no restrictions on Sunday on-premises sales; four states allow no sales of alcohol at on-premises facilities on Sundays. In off-premises settings, hours of sale are limited to a median of 18 hours on weekdays and Saturdays. Restrictions range from no limits on hours of sale in Alabama, Florida, Georgia, Illinois, Louisiana, Maryland, and Nevada to 8 hours of sale allowed in Idaho. On Sundays, states allow a median of 13 hours of alcohol sales at off-premises facilities, with five states having no restrictions; 18 states with "blue laws" allow no off-premises sales.

This review uses the methods of the *Guide to Community Preventive Services (Community Guide)*[10] to assess the effects of changes in the hours during which alcohol is served on excessive alcohol consumption and related harms. A separate review published in this issue assesses the effects of changing days of sale on excessive alcohol consumption and related harms and concludes that increasing days of sale leads to increased consumption and related harms. The focal question of the present review is how, within allowable days of sale, the number of hours available for acquisition and service of alcohol affects excessive alcohol consumption and related harms.

Findings and Recommendations from Other Reviews and Advisory Groups

Several scientific reviews[11–14] have concluded that restricting the hours when alcohol may be sold is an effective strategy for reducing excessive alcohol consumption and related harms. One review,[11] funded by the Center for Substance Abuse Prevention (CSAP), found substantial evidence of harms associated with expanding the hours and days of alcohol sales. This conclusion was based on previous empirical research indicating that the expansion of the hours and days of sale increased prevalence of excessive alcohol consumption and alcohol-related problems. Most prior reviews have combined findings on days and hours and none have examined a threshold effect. The CSAP review included studies prior to 1999; a recent review[14] includes studies published between 2000 and 2008. The present review covers both periods using the systematic methods of the *Community Guide* described below.

Several international bodies have also recommended the control of hours or days of sale, or both as means of reducing excessive alcohol consumption and related harms.[15] For example, a recent review[16] of alcohol control strategies by the WHO found that limiting of hours of sale was an effective method for reducing alcohol-related harms. In Ireland, the Department of Health and Children's Strategic Task Force on Alcohol[17] concluded (p. 30) that

"restricting any further increases in the physical availability of alcohol (number of outlets and times of sales)" is among the most effective policy measures for influencing alcohol consumption and related harms.

Methods

The methods of the *Community Guide* were used to systematically review scientific studies that have evaluated the effectiveness of limiting or maintaining existing limits on the hours of sale for preventing excessive alcohol consumption and related harms.[10] In brief, the *Community Guide* process involves forming a systematic review development team (review team), consisting of subject matter and methodology experts from other parts of the CDC, other federal agencies, and academia, and the Task Force on Community Preventive Services (Task Force); developing a conceptual approach for organizing, grouping, and selecting interventions; selecting interventions to evaluate; searching for and retrieving available research evidence on the effects of those interventions; assessing the quality of and abstracting information from each study that meets inclusion criteria; assessing the quality of and drawing conclusions about the body of evidence on intervention effectiveness; and translating the evidence on effectiveness into recommendations. Evidence is collected and summarized on (1) the effectiveness of reviewed interventions in altering selected health-related outcomes and (2) positive or negative effects of the intervention on other health and nonhealth outcomes. When an intervention is shown to be effective, information is also included about (3) the applicability of evidence (i.e., the extent to which available effectiveness data might generalize to diverse population segments and settings); (4) barriers to implementation; and (5) the economic impact of the intervention. To help ensure objectivity, the review process is typically led by scientists who are not employed by a program that might be responsible for overseeing the implementation of the intervention being evaluated.

The results of this review process are then presented to the Task Force, an independent scientific review board that objectively considers the scientific evidence on intervention effectiveness presented to them and then determines, with the guidance of a translation table, whether the evidence is sufficient to warrant a recommendation on intervention effectiveness.[10] Evidence can be found to be strong, sufficient, or insufficient. Sufficient or strong evidence may indicate benefit, harm, or ineffectiveness of the intervention whereas insufficient evidence indicates more research is needed.

Conceptual Approach and Analytic Framework

The premise of this review is that increased availability of alcoholic beverages through any mechanism facilitates increases in excessive consumption and related harms, and that limiting hours of sale of alcoholic beverages is one way to reduce availability. The limitation of hours of sale of alcoholic beverages was defined as "applying regulatory authority to limit the hours that alcoholic beverages may be sold at on- and off-premises alcoholic beverage outlets." *Limiting* may refer to either *maintaining existing limits* in response to efforts to expand hours of sale or *reducing current limits on hours of sale.* Hours of sale may be regulated at the national, state, or local level or some combination of these. *Off-premises retailing* refers to the sale of contained alcoholic beverages, for instance, at package stores, liquor stores, grocery stores, or convenience stores, for consumption elsewhere. *On-premises retailing* refers to the sale of alcoholic beverages for consumption at the point of sale, for example, at bars, restaurants, or clubs.

Policies that regulate the hours of sale may be influenced by various characteristics of the affected population, including the demand for alcoholic beverages, the age distribution of the population, the religious affiliation and involvement of residents, and the amount of

tourism the area attracts. Policies reducing or expanding hours of sale are hypothesized to affect alcohol consumption and alcohol-related harms through the following means (Figure 1). First, increases or decreases in the hours of sale affect consumers' ability to purchase alcohol by changing its availability. Second, when access to alcoholic beverages changes, consumers may alter their purchasing habits in several ways, including changing their purchase volume, rescheduling their purchases, relocating their purchases, or obtaining alcoholic beverages illegally. Changes in their purchasing habits may then affect their drinking patterns or overall levels of alcohol use, resulting in changes in alcohol-related problems.

Changes in the hours of sale may also affect alcohol-related health outcomes by other means. For example, increases in the hours that alcohol is available at on-premises outlets may be associated with increased social aggregation, which, in turn, may increase aggressive behaviors that are exacerbated by alcohol consumption.[18] Increases or decreases in the hours that alcohol is available in one jurisdiction may also increase or decrease alcohol consumption in adjacent jurisdictions if consumers travel from a jurisdiction with fewer hours to one with greater hours. This may also affect the number of miles traveled to purchase alcohol, and therefore the probability of alcohol-related motor vehicle crashes.

The present review addresses the following research question: what are the effects on excessive alcohol consumption and related harms of changing the hours of sale at on- or off-premises outlets? It was hypothesized that there would be a dose–response relationship related to the magnitude of the change in hours (i.e., the amount by which hours of sale are increased or decreased). Based on this hypothesis, the body of evidence for this review was stratified into studies examining changes of ≥2 hours and <2 hours per day. This cut point was chosen by the judgment of the review team that 2 hours might be a reasonable threshold for a substantial effect and on the distribution of available studies.

The process by which hours of alcohol sale are changed in different settings may also be an important variable to consider in evaluating the effects of such changes. In some settings in which the allowable hours of sale are increased, any licensed facility may extend hours. In others, facilities must apply for an extension and meet certain criteria, such as demonstrating a lack of facility crowding in a neighborhood. It was hypothesized that the additional level of regulation required to apply for extended opening hours might reduce the potential harm from greater access by restricting the implementation and extent of added hours.

Inclusion and Exclusion Criteria

To be included as evidence in this review, studies had to meet certain criteria. First, studies that assessed short-term changes in alcohol availability (e.g., alcohol sales related to a special event such as a sports competition) were not included. Second, eligible studies needed to assess the specific impact of changes in the hours of sale on excessive alcohol consumption, related harms, or both, as opposed to evaluating the effect of change in combination with other interventions. Studies of combined interventions may obscure the effects attributable specifically to changes in hours. Third, because the current focus was on the effects of changes in hours of sale in jurisdictions where these changes occurred, no review was made of studies that examined the effects of changes in hours in one jurisdiction on consumption elsewhere, for example, in neighboring jurisdictions or across a border. Fourth, to increase the applicability of the findings to the U.S., studies had to be conducted in countries with high-income economies[a] according to the World Bank.[19] Fifth, studies had to present primary research findings, not just review other research findings. Sixth, studies had to be published in English. Seventh, studies had to have a comparison group or, at a minimum, compare outcomes of interest before and after a change in the policy related to hours of sale.

Specific types of alcohol-related harms of interest were alcohol-related diseases (e.g., liver cirrhosis), alcohol-impaired driving, alcohol-related crashes, unintentional or intentional injuries, and violent crime. When studies assessed multiple outcomes of interest, those outcomes with the strongest known association with excessive alcohol consumption were selected. Outcome measures that had the strongest known association with excessive alcohol consumption included binge drinking, heavy drinking, liver cirrhosis mortality, alcohol-related medical admissions, and alcohol-related motor vehicle crashes, including single-vehicle night-time crashes (which are widely used to indicate the involvement of excessive drinking).[20] Less-direct measures included per capita ethanol consumption, a recognized proxy for estimating the number of heavy drinkers in a population[21]; unintentional injuries; suicide; and crime, such as homicide and aggravated assault.

Search for Evidence

The following databases were searched: Econlit, PsycINFO, Sociology Abstracts, MEDLINE, Embase, and EtOH. All years of records available on the databases were searched up to February 2008. Although the systematic search ended at this date, the review team is not aware of additional hours of sale research published since this time. (The search strategy will be available on the Community Guide website.) The reference lists of articles reviewed were also searched as well as reference lists from other systematic reviews. Government reports were considered for inclusion, but unpublished papers were not. Subject matter experts were also consulted to identify studies that might have been missed.

Assessing the Quality and Summarizing the Body of Evidence on Effectiveness

Each study that met the inclusion criteria was read by two reviewers who used standardized criteria to assess the suitability of the study design and threats to validity.[10] Uncertainties and disagreements between the reviewers were reconciled by consensus among the review team members. Classification of the study designs accords with the standards of the *Community Guide* review process and may differ from the classification reported in the original studies.

Studies were evaluated based on their design and execution. Those that collected data on exposed and control populations prospectively were classified as having the greatest design suitability. Those that collected data retrospectively or lacked a comparison group, but that conducted multiple pre- and post-measurements on their study population(s), were rated as having moderate design suitability. Finally, cross-sectional studies, those without a comparison group, and those that involved only a single pre- or post-measurement in the intervention population were considered to have the least suitable design. Quality of execution was assessed by examining potential threats to study validity, including an inadequate description of the intervention or of the study population(s), poor measurement of the exposure or outcome, failure to control for potential confounders, and a high attrition rate among study participants. Based on these criteria, studies were characterized as having good quality of execution if they had at most one threat to validity; fair execution if they had two to four threats to validity, and limited quality of execution if they had five or more threats to validity. For example, studies that used only proxy outcome measures were assigned a penalty for this threat to validity. Only studies with good or fair quality of

[a]World Bank High-Income Economies (as of May 5, 2009): Andorra, Antigua and Barbuda, Aruba, Australia, Austria, The Bahamas, Bahrain, Barbados, Belgium, Bermuda, Brunei Darussalam, Canada, Cayman Islands, Channel Islands, Cyprus, Czech Republic, Denmark, Equatorial Guinea, Estonia, Faeroe Islands, Finland, France, French Polynesia, Germany, Greece, Greenland, Guam, Hong Kong (China), Hungary, Iceland, Ireland, Isle of Man, Israel, Italy, Japan, Republic of Korea, Kuwait, Liechtenstein, Luxembourg, Macao (China), Malta, Monaco, Netherlands, Netherlands Antilles, New Caledonia, New Zealand, Northern Mariana Islands, Norway, Oman, Portugal, Puerto Rico, Qatar, San Marino, Saudi Arabia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Trinidad and Tobago, United Arab Emirates, United Kingdom, U.S., Virgin Islands (U.S.).

execution were included in the body of evidence; studies with any level of design suitability were included, other than those with cross-sectional design.

Effect estimates were calculated as relative percentage change in the intervention population compared with the control population using the following formulas:

1. For studies with pre- and post-measurements and concurrent comparison groups:

   Effect estimate=$(I_{post}/I_{pre})/(C_{post}/C_{pre})-1$,

   where:

   I_{post}=last reported outcome rate or count in the intervention group after the intervention;

   I_{pre}=reported outcome rate or count in the intervention group before the intervention;

   C_{post}=last reported outcome rate or count in the comparison group after the intervention;

   C_{pre}=reported outcome rate or count in the comparison group before the intervention.

2. For studies with pre- and post-measurements but no concurrent comparison:

   Effect estimate=$(I_{post}-I_{pre})/I_{pre}$

All studies included in this review assessed the effects of *increasing* hours of sale, and the control condition was *not increasing* hours of sale. Although the analysis here accordingly assesses the effects of increasing hours, the public health intervention of interest is the control condition, (i.e., *limiting or not increasing hours of sale*). This approach rests on the assumption that increasing availability by increasing hours is likely to increase excessive consumption and related harms, and thus not increasing hours when proposed is the public health intervention. For each body of evidence, the review reports a number of *events* of policy changes in hours in a given jurisdiction, each of which may have been the subject of more than one *study* (a research investigation carried out by a single researcher or research group), each of which, in turn, may have been reported in more than one *paper* or *report*.

Results on Intervention Effectiveness

Studies of Changes of >2 Hours in Hours of Sale

Ten studies[22–31] of six events that resulted in a change of ≥2 hours in the hours of alcohol sales met the inclusion criteria. Only one study[22] was of greatest design suitability; however, the principal analysis in this study was presented graphically and did not allow the estimation of a numeric effect size. One study[23] was of moderate design suitability and eight[24–31] were of least suitable design. All studies had fair quality of execution. (A summary evidence table [Table 1][22–40] accompanies this review.)

Four of the six events studied occurred in Australia (in 1966, 1977, 1984, and 1998–2000); one in London, England (in 2005); and one in Reykjavik, Iceland (in 2005). All of the events led to increased hours of sale at on-premises alcohol outlets.

In Victoria, Australia, weekday and Saturday hours were extended from 6:00 PM to 10:00 PM in 1966. Hours allowed prior to this change were not reported. One study[22] compared trends in motor vehicle–related outcomes on weekdays and Saturdays before and after the hours of alcohol sales at on-premises alcohol outlets in Victoria, Australia, were extended, to the same outcomes on Sundays, when there was no change in hours. The author found

that the increase in hours of sales on weekdays and Saturday did not significantly affect the number of crashes that occurred on these days. However, she observed a change in the timing of crashes corresponding to the change in the closing time of the on-premises alcohol outlets. Thus, in this study, it appeared that although the number of events may not have been affected by the change in the closing time of alcohol outlets, their timing was affected. In contrast to this study's findings, two subsequent analyses of the same event concluded that the increase in hours was associated with increases in consumption[23] and motor vehicle crash injuries.[24]

In 1984, hours available for alcohol service in Victoria were extended from 10:00PM until 12:00MN on weekdays and Saturdays and in length of time open from 4 hours to 8 hours on Sundays (a day on which alcohol sales had been previously allowed). Information on hours prior to the weekday and Saturday extension is not given. A study of this event[30] found an increase in motor vehicle crash injuries associated with these increases in hours.

Between July 1998 and June 2000, Victoria granted 24-hour permits to some on-premises alcohol outlets. A cross-sectional study comparing rates of assaults in outlets granted and not granted 24-hour permits is inconclusive.[31] Although authors claim that higher rates of assault are associated with 24-hour facilities, their statements describing results are inconsistent, and the authors do not provide data to allow re-evaluation.

In Tasmania (Australia), licensed premises were allowed to stay open until any hour in 1977. Prior Monday–Saturday opening hours were 10:00AM–10:00PM; Sunday hours, 12NOON–8:00PM. The assumption by policymakers underlying unrestricted closing times was that possibly intoxicated clients would not be exiting the facilities at the same time, potentially decreasing risks, because different outlets would choose different closing hours. A study of this event[25] found an increase in motor vehicle crash injuries associated with these increases in hours.

In Reykjavik, licensed premises were allowed to stay open until any hour in the year 1999 on an experimental basis. Prior closing requirements were 11:30 PM on weekdays and 2:00 AM on weekends. Researchers found increases in emergency room admissions, injuries, fighting, and suspected driving while intoxicated.[26]

Finally, the United Kingdom's Licensing Act of 2003 allowed sales of alcoholic beverages 24 hours a day in England and Wales, beginning in November 2005, subject to local licensing requirements. Three studies assessing the impact of this increase in hours of sale produced mixed results.[27–29] Two studies[28,29] found a relative decrease in harms (violent criminal offenses and alcohol-related maxillofacial trauma, respectively), whereas a third study[27] found a relative increase in harms (alcohol-related assault and injury) subsequent to this increase in hours of sale.

Among the ten studies in this body of evidence,[22–31] two studies[28,29] found that an increase of ≥2 hours in the hours of sale led to decreased alcohol-related harms (i.e., injury and serious violent crime), and six studies[23–27,30] found an increase in alcohol-related harms relative to the period before the increase in hours of sale took place (Figure 2). The study by Raymond[22] found no effect. One study[23] found a nonsignificant increase in alcohol consumption associated with the increase in hours in Victoria, Australia, in 1966.

Information on the requirement that premises seek permits prior to expanding hours may not have been complete in the studies reviewed. To the extent that stated permit requirements accurately reflect the expansion process, there appears to be no systematic effect of permitting. Although the harmful effects of permitted expansions appear to be larger than

those in which permits were not required (Figure 2) there were also effects in the opposite direction for studies of permitted settings.

Studies of Changes of <2 Hours in Hours of Sale

Six studies of five events (reported in ten papers[32–41]) that resulted in a change of <2 hours of sale met the inclusion criteria. All studies were of on-premises alcohol outlets. Three studies (seven papers[32–35,39–41]) were of greatest design suitability, three[36–38] were of least suitable design; all were of fair quality of execution. One study (two papers[39,40]) of the extension of opening hours in England and Wales in 1988 did not allow the calculation of effects for several outcomes, but it reported small and inconsistent results on multiple alcohol-related outcomes. One[41] provides graphics and report using interrupted time series but does not report numeric results.

In 1993, Perth, Australia allowed on-premises outlets to extend their closing time from 12:00MN to 1:00AM.[32–35] Findings were inconsistent, with a reported increase of alcohol wholesale but a decline in drunk driving and an increase in assaults and in alcohol-related crashes. None of these findings was significant.

In December 1979, the state of New South Wales in Australia expanded on-premises alcohol outlet closing hours from 10:00PM to 11:00PM, at the same time expanding Sunday hours and outlet settings. A study of these events[36] proposed using the weekdays as the control in an assessment of the effects of increased Sunday sales on motor vehicle fatalities. However, this comparison is biased toward a null effect, given the change in weekday hours. A comparison of weekday fatalities before and after the weekday expansion indicates a reduction of 2.7% in motor vehicle fatalities over the study period associated with the weekday increase of 1 hour in closing time. However, this outcome may be confounded by a reduction from 0.08% to 0.05% in maximum legal blood alcohol levels in December 1980, which would have been expected to deter drunk driving and reduce motor vehicle injuries.

In 1976, Scotland allowed on-premises outlets to extend their closing time from 10:00PM to 11:00PM.[37,38] Reported changes were small and not consistent in direction. Knight found increased consumption for women and decreased consumption for men, and Bruce reported a small increase in the per capita consumption of beer.

In 1988, England and Wales extended the closing hours at on-premises outlets from 10:30PM to11:00PM and moved the opening time from 11:00AM to 10:00AM.[39,40] The outcomes, including mortality from liver disease and cirrhosis, pancreatitis, alcohol poisoning, “alcohol-dependent syndrome,” alcohol psychosis, workplace absenteeism and injury, and various motor vehicle–related outcomes) assessed in these studies were heterogeneous and included the seemingly contradictory findings that in comparison with changes in the control setting (Scotland), convictions for sales to underage patrons increased by 64.1% (95% CI=21.2%, 99.0%), whereas sales to minors fell substantially. Another finding was an increase in recorded violent crime of 15.5% (95% CI= 14.0%, 17.0%). (See Table 1.)

Finally, in 1996, Ontario Province extended closing hours in on-premises alcohol outlets from 1:00AM to 2:00AM. A study[41] of this event used graphics and interrupted time series to assess the effects of this change on all and alcohol-related fatal motor vehicle crashes. Changes in Ontario were compared with changes in Michigan and New York, neither of which changed hours of sale during the same period. The study also assessed changes in the sales of beer, wine, and spirits in Ontario from the period before to the period following the policy change. Numeric results are not reported. Beer consumption declined over the study period, whereas the consumption of wine and spirits declined in the early 1990s and then

increased in the later 1990s. The authors conclude that changes in motor vehicle outcomes are “minimal.” Their graphics suggest a shift of the timing of alcohol-related fatalities to later hours following the extension of hours of sale.

This small body of evidence indicates no consistent effects of changes of <2 hours on alcohol-related outcomes. Four events of increases in hours of sale were studied. Only one study of increased hours of sale in Perth, Australia, reported substantial increases in wholesale alcohol purchases, assaults, and motor vehicle crashes. Two studies (of events in England and Wales and in Ontario, Canada) did not provide numeric results but reported small and inconsistent changes in alcohol-related outcomes including alcohol consumption, multiple alcohol-related causes of mortality, and motor vehicle crashes. Two studies of increased hours of sale in Scotland also reported small and inconsistent changes in alcohol sales and consumption.

Again, information on the requirement that premises seek permits prior to expanding hours may not have been complete in the studies reviewed. To the extent that stated permit requirements accurately reflect the expansion process, there appears to be no systematic effect of permitting (Figure 3).

Applicability

The studies in this review were conducted in a variety of settings outside the U.S. and during a wide range of time periods. None-theless, the association between restrictions on the hours when alcohol may be sold and alcohol-related harms was consistent across most geographic locations (all in high-income countries) and time periods, and the findings of this review are likely to be relevant for considering the potential impact of modifying the number of hours when alcohol may be sold in the U.S.

Other Harms and Benefits

Maintaining hours of sale may sustain quality of life in communities by controlling alcohol availability, excessive alcohol consumption, and health and social harms resulting from excessive alcohol use (e.g., public drunkenness); evidence of effects on quality of life were not provided by the studies reviewed. Although it is possible that crimes such as illicit alcohol sales may increase in localities where the hours of sale are limited, no evidence of such effects was found in any of the studies evaluated. One study[26] noted increased workload among law enforcement personnel associated with expanded hours of sale.

Barriers

The maintenance and reduction in the number of hours when alcohol may be sold may affect overall alcohol sales and may thus be opposed by commercial interests involved in manufacture, distribution, and sale of alcoholic beverages. The alcohol industry has generally supported policies that remove restrictions on the access to alcohol.[42]

State pre-emption laws (i.e., state laws that prevent the implementation and enforcement of local policies more restrictive than statewide regulations) can also undermine efforts by local governments to regulate hours of sale.[6] Indeed, the elimination of pre-emption laws related to the sale of tobacco products is one of the health promotion objectives in *Healthy People 2010*.[5] However, there is no similar objective in *Healthy People 2010* related to the local sale of alcoholic beverages.

Economics

No studies were identified that assessed the economic impact of reducing the number of hours when alcohol may be sold. No study was found that specifically estimated the

magnitude of commercial losses in sales and tax revenues because of a policy of restricting hours of alcohol sales.

Summary

This review found that increasing the hours when alcohol may be sold by ≥2 hours increased alcohol-related harms. Evidence supporting this conclusion was based on studies conducted in on-premises settings outside the U.S. According to *Community Guide* rules of evidence, these findings provided sufficient evidence for the effectiveness of maintaining limits on hours of sale for the reduction of alcohol-related harms when efforts are made to increase hours by ≥2.[10] Because no qualifying study assessed the effects of reducing hours of sale, the only direct inference that can be made is that reducing hours of sale by ≥2 is likely to avert alcohol-related harms. However, it may also be reasonable to expect that reducing hours of sale would also reduce alcohol-related harms.

Because there was no consistent effect on excessive alcohol consumption or related harms of increasing hours of sales by <2 hours, according to *Community Guide* rules of evidence, there was insufficient evidence that this intervention had a meaningful effect.[10] Insufficient evidence means that it is not possible to determine from the available evidence whether this policy change had a meaningful effect.

Research Gaps

All existing research on hours of sale to date has been conducted in nations other than the U.S. It would be useful to have studies of changes in hours of sale in U.S. settings to confirm results from other settings. In addition, all research thus far has assessed the effects of *increasing* hours of sale. Although it may be a less-frequent event, evaluating the effects of *reducing* hours of sale for preventing excessive alcohol consumption and related harms would be useful. Evidence on changes in hours of sale of <2 hours is currently insufficient because of inconsistent findings. Thus, when such changes occur, it may be worthwhile to assess the effects of smaller changes in hours of sale on excessive alcohol consumption and related harms to improve our understanding of the “dose–response” and “threshold” relationships between changes in hours of sale and public health outcomes.

Additional research is also needed to more fully assess the costs and benefits of restricting the number of hours when alcohol is sold. From a societal perspective, economic elements should include intervention costs; loss in sales, tax revenues, and employment; reductions in fatal and nonfatal injuries, crime, and violence; gains in safety and public order; and averted loss of household and workplace productivity.

Finally, no studies were found that assessed the effects of changes in hours of sale in off-premises settings. Although consumers at off-premises settings are less likely to be directly affected by the effects of excessive consumption at the place of purchase, it is nevertheless possible that changes in availability in these settings may also affect alcohol-related harms. This issue merits investigation.

Discussion

Based on a systematic review of qualifying studies, this review confirms the findings of previous reviews and adds details regarding a possible dose or threshold effect. Evidence of the effects of changes in hours of sale of <2 hours was insufficient to determine effectiveness because of inconsistency among findings in the body of evidence, leaving unanswered the question of the effects of small increases in hours of sale. Data are not sufficient to allow systematic assessment of the relative percentage increase in hours (over a baseline) or the placement of the hours within the day.

All of the studies included in this review assessed the effects of increasing hours of sale at on-premises outlets, consistent with the international trend toward expanding the availability of alcoholic beverages. Further scientific evidence is needed to fully assess the symmetry between the effects of maintaining existing limits on the hours of sale compared with reducing hours of sale.

The only available evidence of the effects of reducing hours of sale was from a study in Brazil,[43] which did not qualify for inclusion in the review because Brazil is not a high-income nation, and, in general, studies of alcohol consumption from middle- and lower-income nations are thought not to be directly applicable to the contemporary U.S. context. In 1999, the city of Diadema had very high homicide rates; 65% of these were alcohol-related. Most of the homicides occurred between 11:00PM and 6:00AM. Diadema law allowed 24-hour opening of alcohol outlets. In July 2002, a new city law required bars to close at 11:00PM. From 2002 to 2005, homicide rates in the city declined by 44% (95% CI=27%, 61%), controlling for mortality trends. During this time period, there was also a 17% decline in assaults against women (the only additional outcome assessed); this finding, however, was not significant.

In addition to the lack of studies that assessed the effect of stricter limits on the hours when alcohol may be sold, the body of qualifying studies in this review had several other limitations. First, some studies did not directly assess the impact of relaxing restrictions on the hours of sales on excessive alcohol consumption and alcohol-related harms, but rather relied on proxy measures of these effect outcomes (e.g., criminal arrest rates). Second, nearly all of the studies relied on population-based data from public health surveillance systems that did not capture information on alcohol control policies. As a result, many of these studies were unable to control for some potential confounding factors. However, these studies generally assessed changes in the same geographic area before and after the implementation of changes in hours of sale over a fairly short time period. Other contextual factors that could also influence alcohol sales and consumption (e.g., changes in alcohol excise taxes) at the country, state, or community levels were likely to have remained fairly constant during the study periods, allowing for a valid assessment of the impact of changing hours of sale, independent of other factors, on alcohol-related harms.

The findings in this review support the potential value of allowing local communities to maintain restrictions on hours of sale. If further research supports the effectiveness of local restrictions on hours of sale, it would also argue for eliminating state pre-emption laws that prohibit local governments from enacting alcohol control policies more restrictive than those that exist statewide.

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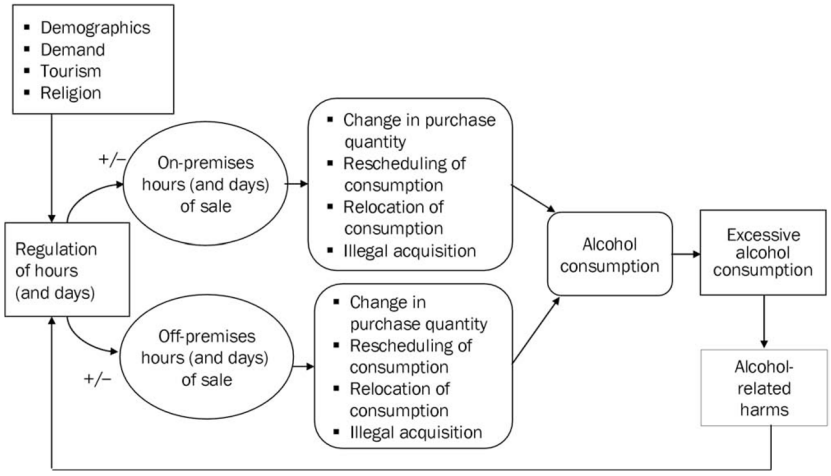

Figure 1.
Effects of regulation of hours (and days) of alcohol sales on excessive alcohol consumption and related harms

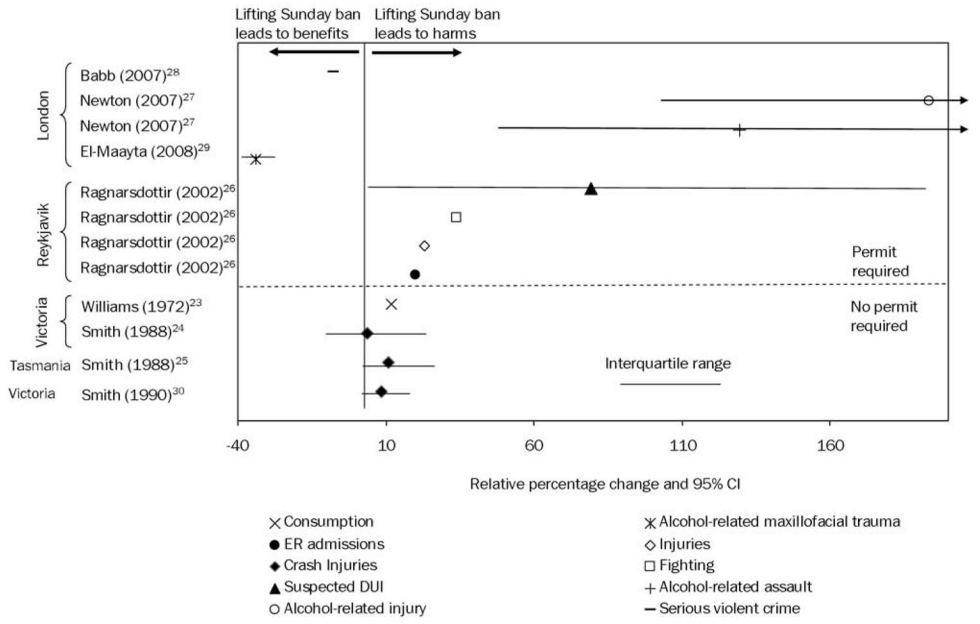

Figure 2.

Relative percentage change in diverse outcomes associated with increases of ≥2 hours

DUI, driving under the influence

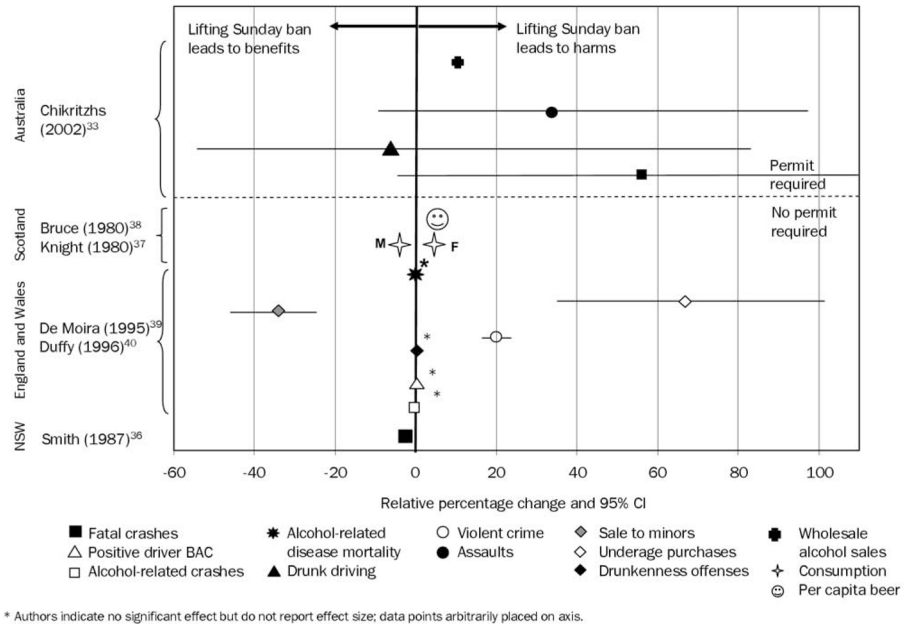

Figure 3.

Relative percentage change in diverse outcomes associated with increases of <2 hours

NSW, New South Wales

Table 1

Evidence of the effects of limits of alcohol hours of sale on excessive alcohol consumption and related harm

Study/design/execution	Population/study time period	Intervention/comparison	Analysis/outcome	Reported findings	Review/effect size
Policies allowing a change of ≥2 hours—Increasing hours					
El-Maaytah (2008)[29] Design suitability: Least Pre/post, no control Quality of execution: Fair (4 limitations)	Location: University College Hospital, London, England, and Wales Dates: Intervention: November 24, 2005 Pre-intervention: November 24, 2004–April 30, 2005 Post-intervention: November 24, 2005–April 30, 2006	Intervention: Flexible opening hours: Potentially 24-hour opening, 7 days a week, dependent on special license Note: Granting of licenses subject to consideration of impact on local residents, businesses, and expert opinion Control: None	Analysis: Chi-square Outcome: ARMT (6 months before compared to 6 months after)	ARMT Pre: 1102 Post: 730	Relative % change (95% CI): −33.8% (−39.7, −27.3)
Newton (2007)[27] Design suitability: Least Pre/post, no comparison Quality of execution: Fair (3 limitations)	Location: London Dates: Intervention: November 2005 Pre-intervention: March 2005 (9:00PM–9:00AM) Post-intervention: March 2006 (9:00PM–9:00AM)	Intervention: Experimental unrestricted hours Control: None	Analysis: Mann–Whitney *U* test for differences in proportions Outcomes: Numbers and percentages of “alcohol-related” ER admissions, injuries, and hospital referrals	Significant increases in number of alcohol-related admissions, alcohol-related assault, alcohol-related injury, and alcohol-related hospital admissions	Relative % change (95% CI): Alcohol-related assault: 129.6 (46.1, 260.8) Alcohol-related injury: 193.2 (108.2, 312.8)
Babb (2007)[28] Design suitability: Least Pre/post, no comparison Quality of execution: Fair (3 limitations)	Location: London Dates: Intervention: November 2005 Pre-intervention: December 2004–November 2005 (9:00PM–9:00AM) Post-intervention: December 2005– November 2006 (9:00PM – 9:00AM)	Intervention: Experimental unrestricted hours, along with fines/ penalties for service to drunk clients and children Control: None	Analysis: 30 of 43 home office police forces provide data on arrests for serious and less-serious violent crimes. Offenses not specified as alcohol-related	Moving averages calculated for nighttime arrests, 6:00PM to 5:59 AM	Relative % change: Serious offenses (including homicide and manslaughter): −9.5% Less-serious offenses (with wounding): −5.4% Less-serious offenses (with wounding) in city centers and near licensed premises: −4.3% Assault without injury: −2.7% Assault without injury in city centers and near licensed premises: 3.1%
Ragnarsdottir (2002)[26] Design suitability:	Location: “relatively small” city center, Reykjavik Dates:	Intervention: Experimental unrestricted hours Control: Unchanged hours	Analysis: Percentages; no tests of significance Outcomes:	For all outcomes, location not specified as city center (the	Relative % change:

Study/design/execution	Population/study time period	Intervention/comparison	Analysis/outcome	Reported findings	Review/effect size
Least Pre/post, no comparison Quality of execution: Fair (3 limitations)	Intervention: July 1999–July 2000 Pre-intervention: March 1999–April 1999 (8 weekend nights) Post-intervention: March 2000–April 2000 (8 weekend nights) *Weekend nights defined as Saturday or Sunday from 12:00 MN to 7:00AM		• Emergency ward admissions (not specific to city center) • Suspected drunk driving cases	location of intervention) or outside city center. Emergency ward admissions: Weekend nights: 31% increase All-day: 3% increase Weekends (all day): 20% increase Weekdays: 2% decrease Reasons for admission include incidents often related to drinking: Accidents and other mishaps: 23% increase Fighting: 34% increase Non–alcohol-related admission types: No change Suspected drunk driving: 1999: 29 2000: 52	Weekend emergency ward admissions: 20%* Accidents and other mishaps: 23%* Fighting: 34%* Suspected drunk driving: 79.3% (13.8, 182.4)
Smith (1988)[25] Design suitability: Least Pre/post, no comparison group Quality of execution: Fair (3 limitations)	Location: Tasmania, Australia Dates: Intervention: August 10, 1977 Pre-intervention: July 1, 1971–June 30, 1977 Follow-up: October 1, 1977–September 30, 1978	Intervention: Unrestricted hours allowed throughout week. Smith reports numbers of actual hours did not change, but hours shifted to later times. Exceptions (mandatory closing): Sundays 5:00 AM–12:00NOON Sundays 8:00PM–12:00MN Good Friday Prior hotel opening hours: Monday–Saturday: 10:00 AM–10:00PM Sunday: 12:00NOON–8:00PM Control: Number of injury crash from 6:00 PM to 10:00PM	Analysis: Chi-square Outcome: Crash injury between 10:00PM and 6:00AM	Traffic injury crash: Increased between 10:00PM and 6:00AM. Although the number occurring directly after the former closing time decreased, both the proportion and the absolute number of traffic injury crash from 12:00MN to 6:00AM increased, for a total overall increase.	Relative % change (95% CI): Traffic injury crash: 10.8% (−1.5, 21.2)
Raymond (1969)[22] Design suitability: Greatest Pre/post, no comparison. Quality of execution: Fair (3 limitations)	Location: Melbourne, Victoria (Australia) Dates: Intervention: February 1, 1966 Pre-intervention: 1964–1965 Follow-up: 1966–1967 after period Note: data collection begins January 1, 1966	Intervention: Closing time extended from 6:00PM to 10:00PM Control: Sundays	Analysis: Outcomes: • Casualty accidents • Total accidents – Pedestrian accidents – Single-vehicle accidents – Multi-vehicle accidents	Summary of major findings: Total accidents: No change Hourly distribution of accidents occurring from 6:00PM to 11:00PM changed significantly: Sharp decrease from 6:00PM to 7:00PM and an increase from 10:00PM to 11:00PM.	Graphical comparison of weekdays and Saturday with hours change vs Sunday without change: No effect

Study/design/execution	Population/study time period	Intervention/comparison	Analysis/outcome	Reported findings	Review/effect size
Williams (1972)[23] Design suitability: Moderate Interrupted time series Quality of execution: Fair (2 limitations)	Location: Victoria, Australia Dates: Intervention: January 2, 1966 Pre-intervention: 1958–1966 Follow-up: 1966–1969	Intervention: Closing time extended from 6:00PM to 10:00PM Control: None	Analysis: Maximum likelihood estimates Outcome: Consumption of alcohol in Aus$ sales per capita controlled for price of beer and consumer price index	Sales increase $1.9 per quarter due to 10:00PM closing Equivalent to 12% increase Note: Author reports no significant effect because SEs are large	Consumption change: 12% (ns) * *CIs not calculable because of lack of data
Smith (1988)[24]	Location: Victoria, Australia Dates: Intervention: January 2, 1966	Intervention: Closing time extended from 6:00 PM to 10:00PM Control: None	Injury crash change: Yearly vehicle crashes 3 years before and 1 year after the change in hours. No assessment of alcohol- relatedness of crashes	An increase of 11.5% in automobile crash injuries associated with the change in hours (not taking entire day into account)	Relative % change (95% CI): 3.6% (−16.6, 28.8)
Smith (1990)[30] Design suitability: Least Pre/post, no comparison Quality of execution: Fair (3 limitations)	Location: Victoria, Australia Dates: Intervention: **1** July 13, 1983 **2** November 1984 Pre-intervention: January 1, 1980–December 31, 1983 Follow-up (1): January 1, 1984–December 31, 1984 Follow-up (2): January 1, 1985–December 31, 1985	Intervention: **(1)** Two 2-hour periods allowed on Sundays between 12:00NOON and 8:00PM **(2i)** Full hours allowed between 12:00NOON and 8:00PM on Sunday **(2ii)** Monday to Saturday sales extended from 10:00PM to 12:00MN **(2iii)** Sunday restaurant hours increased to 12:00NOON to 11:30PM (12:00NOON–4:00PM and 6:00PM–10:00PM) Control: None	Analysis: Chi-squares Outcome: Traffic crash injury	Injury crash during the 4 hours after 8-hour Sunday session	Relative % change (95% CI): 8.5 (2.2, 15.2)
Briscoe (2003)[31] Design suitability: Least Cross-sectional Quality of execution: Fair (3 limitations)	Location: Victoria, Australia Dates: Intervention: July 1998–June 2000	Intervention: 24-hour permit granted to some on- premises alcohol outlets	Analysis: descriptive statistics Outcomes: Number of assaults within outlets during study period	Summary of major findings: Authors claim that there is an association between 24-hour permits and high rates of assaults. However, findings appear contradictory and do not allow re-evaluation.	Inconclusive
Policies allowing a change of <2 hours					
Chikritzhs (1997)[32–35] Design suitability:	Location: Perth, Western Australia (WA)	Intervention (1988): ETPs only (until 1:00AM instead of 12MN)	Analysis to test for ETP association: • Paired *t*-tests	Monthly assaults per hotel: ETP hotels:	Relative % change:

Study/design/execution	Population/study time period	Intervention/comparison	Analysis/outcome	Reported findings	Review/effect size
Greatest Before and after design with comparison Quality of execution: Fair (3 penalties)	Dates: Data collected from July 1, 1991 to June 30, 1995 for: • Assaults Data collected from July 1, 1990 to June 30, 1996 for: • Road-block breath testing • Accidents • Routine police patrols	Control: Hotels that served in standard hours (until 12: 00MN) throughout study period (non-ETPs)	• Repeated measures analysis • Multiple Linear Regression Outcomes: • Monthly assault rates • Impaired driver BAL • Alcohol-related crashes • Wholesale alcohol purchase	Pre: 0.121; Post: 1.87 Non-ETP hotels: Pre: 0.112; Post: 0.133 *Adjusting for alcohol sales eliminated effect of ETPs (e.g., increased consumption accounted for increased harm) ETP hotels: Pre: 670,403; Post: 881,048 Non-ETP hotels: Pre: 686,094; Post: 815,822 Alcohol-related road crashes: ETP hotels: Pre: 0.0781; Post: 0.0808 Non-ETP hotels: Pre: 0.0731; Post: 0.0503	Monthly assaults per hotel: 30.1% Wholesale alcohol purchases: 10.5% Alcohol-related road crashes: 51.3%
Smith (1987)[36] Design suitability: Least Before and after design, no comparison Quality of execution: Fair (3 penalties)	Location: New South Wales, Australia Dates: Intervention: Weekday/Saturday closing hours: changed from 10:00PM to 11:00PM Pre-intervention: 1976–1979 Follow-up: 1980–1981	Intervention: Hours: Weekday/Saturday evening closing hours extended from 10:00PM to 11:00PM December 1979 Sunday hours and outlet types also expanded December 1980 BAC levels lowered from 0.08% to 0.05% Control: No comparison group	Analysis: Percentage change Outcomes: Motor vehicle fatalities	Summary of major findings: Findings on this outcome not considered	Relative % change in motor vehicle fatalities: −2.7%
Knight (1980)[37] Design suitability: Least Before and after study without comparison Quality of execution: Fair (4 limitations)	Location: 4 major cities and central belt of Scotland Dates: Intervention: Hours: December 13, 1976 Pre-intervention: October–November 1976 Follow-up: March 1977	Intervention: Hours: Evening closing hours extended from 10:00PM to 11:00PM in December 1977 (Sunday licenses issued October 1977) Control: No comparison group	Analysis: Percentage changes Outcomes: Consumption and patterns of consumption	Change in consumption (in standard units) from before to after the time change: Men: −0.9 units/week Women: 0.2 units/week	Relative % change in consumption following extended hour: Men: −4.9% Women: 3.8%
Bruce (1980)[38] Design suitability: Least Before and after study with no comparison Quality of execution: Fair (2 limitations)	Location: 4 major cities and central belt of Scotland Dates: Intervention: Hours: December 13, 1976 Pre-intervention: October–November 1976 Follow-up: March 1977	Intervention: Hours: Evening closing hours extended from 10:00PM to 11:00PM in December 1977 (Sunday licenses issued October 1977) Control: No comparison group	Analysis: Percentage changes Outcomes: Beer sales in bulk barrels	Beer sales in bulk barrels Mean 1970–1976/1977 3,7856,143/40,262,000 3,264,000/366,800	Relative % change: Beer sales in bulk barrels 5.7%

Study/design/execution	Population/study time period	Intervention/comparison	Analysis/outcome	Reported findings	Review/effect size
De Moira (1995)[39] Duffy (1996)[40] Design suitability: Greatest Prospective data collection with intervention and control populations Quality of execution: Fair (2 limitations)	Location: England/Wales Dates: Intervention: August 1988 Pre-intervention: 1980–1988 Follow-up: 1988–1991	Intervention: Extension of opening and Sunday hours • Opening hour changed from 11:00AM to 10:00AM • Extra hour on Sunday (hours allowed from 12: 00NOON until 10:30PM, with a mandatory break of 4 hours beginning at 3:00PM) • Drinking-up time increased from 10 to 20 minutes (weekdays only) • Off-premises sales allowed from 8:00AM Control: Scotland (positive control, having already extended hours several years previously)	Analysis: Logistic linear regression, analysis of deviance Outcomes: • Liver disease and Cirrhosis Mortality • Pancreatitis mortality • Alcohol poisoning • Alcohol-dependent syndrome • Alcohol psychosis • Workplace absenteeism • Workplace accidents • Road accidents • Positive breath tests • Drunk driving convictions • Drunkenness offenses • Crimes of violence • Underage drinking	Summary of major findings: Mortality: No increase in: • Liver disease and cirrhosis • Pancreatitis • Alcohol poisoning • Alcohol-dependent syndrome • Alcohol psychosis Workplace: No increase in: • Workplace absenteeism • Serious or fatal workplace accidents Increase in: • Slight workplace accidents RR Scotland: 1.34 RR E and E: 1.01 Motor vehicle: No increase in: • Drunk driving convictions • Positive breath tests • Fatal and serious road accidents Increase in: • Slight road accidents Relative % change: 3.5% Public order: No increase in: • Drunkenness offenses	Relative % changes (95% CI): Mortality from diverse alcohol-related diseases: no effect Convictions for sales to underage patrons: 64.1% (21.2%, 99.0%) Purchases by minors: −62.4% (72.9%, 46.5%) Recorded violent crime: 15.5% (14.0%, 17.0%)

Study/design/execution	Population/study time period	Intervention/comparison	Analysis/outcome	Reported findings	Review/effect size
				• Crimes of violence • Underage drinking	
Vingilis (2005)[41] Design suitability: Greatest Prospective data collection with intervention and control populations Quality of execution: Fair (3 limitations)	Intervention: May 1996 Pre-intervention: 1992–1996 Follow-up: 1996–1999	Intervention: On May 1, 1996, Ontario, Canada, amended the Liquor License Act to extended closing hours for alcohol sales and service in licensed establishments from 1:00AM to 2:00AM Control: Michigan and New York states, in which similar changes did not occur	Analysis: Supposedly interrupted time series, but results not given. Graphical analyses. Outcomes: Motor vehicle fatalities, alcohol-related and all Consumption	Summary of major findings: No significant change relative to controls Declines in consumption reported	Findings: No significant change relative to controls

* Cls not calculable due to the lack of data.

ARMT, alcohol-related maxillofacial trauma; ETP, extended trading permit

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The impact of casinos on fatal alcohol-related traffic accidents in the United States

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ABSTRACT

Casinos have been introduced throughout the U.S. to spur economic development and generate tax revenues. Yet, casinos may also be associated with a variety of social ills. One issue that has not been empirically tested in the literature is whether there is a link between casino expansion and alcohol-related fatal traffic accidents. We suspect a link may exist since casinos often serve alcohol to their patrons and, by their dispersed nature, could impact driving distances after drinking. Using the variation in the timing and location of casino openings over a 10-year period, we isolate the impact of casino introduction on alcohol-related fatal accidents. Results indicate that there is a strong link between the presence of a casino in a county and the number of alcohol-related fatal traffic accidents. However, this relationship is negatively related to the local-area (county) population. Results prove durable, as we subject them to robustness checks.

1. Introduction

With the exception of Nevada and Atlantic City, NJ, casinos had no significant presence in the United States until Congress passed the Indian Gaming Regulatory Act (IGRA) in 1988. The IGRA opened the door for formalized Indian casinos by allowing gaming to exist on tribal lands, subject to a compact agreement with the state government.[1] Shortly after the IGRA passed, several states also began to legalize commercial casinos. Together these changes in the legislative landscape surrounding casinos led to a tremendous increase in the presence of casinos across the United States. By the end of 2008 commercial casinos were operating in 12 states with annual revenues exceeding $32 billion (American Gaming Association, 2009), while tribal casinos had opened in 29 states with annual revenues exceeding $26 billion (National Indian Gaming Commission, 2009). Collectively, the casino sector has a significant economic presence.

While the casino industry is one of the fastest growing entertainment industries in the U.S., its growth is not without controversy. Casino opponents argue that casinos bring a variety of social problems, including increases in crime, bankruptcy, and divorce. Recently claims of casinos leading to higher drunk driving prevalence have also been noted. For example, newspaper reports often link DUI arrests and/or alcohol-related traffic fatalities to casinos that serve alcohol (e.g., Cornfield, 2009; Smith, 2010). Many casinos follow a "destination resort" model; they include restaurants, bars, shows, shops, and a hotel. Other casinos cater more to a local clientele. At a minimum, both types of casino typically include a bar service and casino customers often enjoy drinking alcohol while they socialize and play casino games. The fact that alcohol is readily available at many casinos suggests that casinos may, in fact, be a catalyst for increased drunk driving and hence, increased alcohol-related traffic fatalities. However, a more detailed look at the possible impact of casinos on drunken driving behavior demonstrates that there could be an inverse relationship between casinos and drunk driving under the right circumstances. Regardless, we are aware of no previous study that rigorously examines the possibility of such a link.

The purpose of this study is to test whether there is, in fact, a relationship between the spread of casinos and the number of alcohol-related fatal traffic accidents. Our analysis utilizes U.S. county-level data from 1990 to 2000, a period of time that saw the overwhelming majority of casino openings in the last 30 years. Overall, this presents a natural laboratory to test the effects of

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[1] See Light and Rand (2005) for a comprehensive discussion of tribal casinos and relevant law.

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casino entry on accident risk. In the next section we provide background information and discuss various theoretical issues and predictions surrounding possible effects.

In general, our estimates reveal that casino entry does significantly impact the danger posed by drunk drivers, but that the direction and size of this effect is related to the size of the population where the casino opens. Specifically, our best estimate indicates that alcohol-related fatal accidents increase by about 9.2% for casino counties with the mean log population, yet this estimated effect declines as population increases. Although this is a striking result, we will demonstrate below that our estimates are robust to the inclusion of controls for area and time fixed effects, changes in population, changes in other policies that may impact drunk driving behavior (e.g., beer taxes, blood alcohol content regulations), as well as changes in factors that may influence overall driving risk separate from drinking behavior (e.g., road construction, weather). Furthermore, these estimates are also robust to several alternative definitions of the control group, the dependent variable, and to the estimation method selected (e.g., weighted least squares, Poisson, probit).

2. Background and theoretical considerations

The principle motivation by governments to allow casinos to open in their jurisdictions is the hope that casinos will create economic growth and increase tax revenues at the state level. The casino expansion of the early 1990s had mostly died off until the 2007–09 recession compounded state-level fiscal crises. Consequently, much of the existing research focuses on the pre-2000 period of time that saw the vast majority of casino openings in the U.S. Given the typical motivation for casinos, research has often focused on evaluating the impacts of casino introduction on economic development or government revenue generation (e.g., Elliott and Navin, 2002; Mason and Stranahan, 1996; Siegel and Anders, 2001). While less numerous, other studies have looked at how casino introduction has impacted consumers' behavior with respect to related sectors of the local economy, such as hotels, restaurants, bars, and property values (e.g., Anders et al., 1998; Popp and Stehwien, 2002; Siegel and Anders, 1999; Wenz, 2007). Of course, other researchers have also recognized that this large increase in the presence of casinos and gambling could have important impacts on crime, bankruptcy, divorce, and other social ills (e.g., Barron et al., 2002; Curran and Scarpitti, 1991; Garrett and Nichols, 2008; Grinols and Mustard, 2006; Stitt et al., 2003; Thalheimer and Ali, 2004). However, little attention has been paid to how the introduction of casinos into a community or region impacts drinking and driving habits and their effects. This lack of research is surprising, given the degree to which alcohol use often accompanies casino gambling.

There is an extensive literature that estimates the impacts of changes in public policies, such as minimum legal drinking age laws, beer taxes, and zero-tolerance policies, on drunk driving behavior (e.g., Carpenter, 2004; Chaloupka et al., 2002; Dee, 1999; Ruhm, 1996). The motivation behind these policy changes is that they will impact individual behavior and reduce drunk driving. Of course, any factor that changes drinking behavior or the location of drinking activities can impact drunk driving outcomes, whether intended or not. The introduction of casinos into an area may be one such factor.

One can imagine a variety of ways by which casinos might impact drunk driving behavior. For example, there are several reasons to suspect that casino presence may lead to an increase in drunk driving. First, the location of a casino could promote an increase in the total number of miles driven after drinking, which could lead to an increase in automobile accidents in an area following the opening of a casino. Existing literature on consumer behavior supports the contention that small differences in consumer utility can prompt changes in driving habits. For example, the cross-border shopping literature indicates that people will consume what they desire in an alternate location when their own jurisdiction has limits or restrictions on consumption, or relatively high costs (Asplund et al., 2007; Ferris, 2000). Some Canadians, for example, drive great distances to consume health services in the U.S. In the case of casinos, their presence may draw people from a large surrounding area to gamble. However, this effect on drunk driving fatalities would depend on the extent to which the introduction of casinos actually does lead to a net increase in the number of people driving and the average distance to casinos. The distance to casinos is likely to decrease as casinos become more widespread, but the introduction of casinos could increase the number of people driving in the area immediately surrounding the casino. If this is the case, we would expect that the introduction of a casino will likely increase the number of miles driven in a county, which could also increase the amount of drunk driving accidents, *ceteris paribus*, as drinking and gambling often go together.

Similarly, a product differentiation effect could also lead to greater distances driven after drinking. Specifically, Lee (1997) applies a Löschian location model (Lösch, 1954) to describe the hexagonal market areas created by bar service differentiation. He posits that bar differentiation leads to more drunk driving. As casinos can act as a substitute for bars in many ways, yet allow for extensive gambling activities while drinking, the introduction of a casino may increase the degree of product differentiation among drinking options in an area. So, one can assume that consumers will drive to the casino if their additional transportation and time costs do not cause their total costs to exceed their benefits from being able to gamble and drink. Therefore, the casino represents a new option for some consumers and may be likely to increase the proportional miles driven drunk as a result.

Of course, the impact of casinos on drunk driving could be negative, and this alternative possibility must be considered. The attraction of a nearby casino may cause a substitution effect, as many individuals substitute away from other discretionary pursuits, such as a night out at the local bar or club, to spend an evening gambling at a casino. As a result, if the ability to gamble at a casino creates a sufficient substitute to drinking at a bar, or if casino patrons drink less at the casino than they would have without the casino option, then we may see a decrease in alcohol-related accident risk in an area after the introduction of a casino. Moreover, while many casinos must follow local "bar time" laws when it comes to serving alcohol, the casinos themselves are typically open 24 h. This could give intoxicated individuals the opportunity to sober up before driving home.[2] We should also point out that, unlike casinos in Las Vegas or Atlantic City, which give complementary alcoholic beverages to those gambling, many casinos charge for alcoholic beverages, so a gambler would have to "sacrifice" some of their gambling dollars in order to purchase a drink. This might lead patrons to drink less at the casino than they might have otherwise at some bar or nightclub.[3] Lastly, if we assume that some

[2] We see professional sporting events actively facilitating this behavior as they frequently stop alcohol sales after the third quarter of a football game or after the 7th inning in a baseball game, for example.

[3] Casinos' policies with respect to alcohol vary by market; some states have a law that prohibits casinos providing free alcohol to patrons. That said, there is extensive complexity involved in identifying the casino specific treatment of these policies, which prohibited us from being able to specifically control for casino alcohol policies in our model. This exclusion would only impact our findings significantly if there was correlation between the county population and the likelihood of offering free

drinkers choose to frequent the closest drinking establishment to their residence, by increasing the number of drinking options in a county, the casino could reduce the distance driven after drinking among some intoxicated drivers.

Regardless of the economic theory, the literature discussed above would support the idea that the relatively dispersed nature of casino locations across the country could lead to an increased accident risk due to greater distances traveled by drunk driving gamblers. Indeed, some casinos have acknowledged such problems. For example, the Connecticut-based Mohegan Sun Casino admitted that there is a problem with drunk drivers leaving their casino (WFSB Hartford, 2009). A few studies have indirectly examined the link between casinos or gambling and DUI arrests (e.g., Reuter, 1997; Stitt et al., 2003; Stokowski, 1996; Wilson, 2001), but drunk driving is not their primary focus. Furthermore, none of these studies addresses the potential link between casinos and *alcohol-related fatal accidents*. We can find no study that has previously tested for such a link.

In addition to the economic literature on drinking and driving, the gambling and psychology literatures provide an anecdotal link between casinos and drunk driving. In particular, a large proportion of problem gamblers[4] have coexisting disorders ("comorbidity"), including alcohol abuse, which may affect the relationship between casinos and drunk driving. For example, Welte et al. (2001) find that problem drinkers (alcoholics) are 23 times more likely to have a gambling problem than individuals who do not have a drinking problem. Petry et al. (2005) have estimated that over 70% of pathological gamblers in the U.S. also have an alcohol use disorder. Since gamblers are the individuals we would most expect to increase their driving after the introduction of a casino, and since a disproportionate number of alcoholics are gamblers, then it is plausible to expect a casino to encourage travel disproportionately by the individuals who are most likely to drive while intoxicated. Of course, casino patrons are not all problem gamblers and alcoholics, but there is a small proportion of the population that has drinking and gambling problems, and this may have an impact on any relationship between casinos and drunk driving and therefore, on alcohol-related fatal accidents.

Given the discussion above about the potential impacts of casino introduction on drinking and driving behavior, we must consider what factors we anticipate will impact the strength of a particular effect on drunk driving. Specifically, we believe that the largest factor is likely to be population of the area where the casino locates. In large cities, casino patrons will disproportionately be locals, who do not need to travel great distances, or who may have public transportation options. Indeed, the opening of a casino in an urban area may not be expected to have any impact on miles driven, since the casino represents one new entertainment option out of many existing ones. Yet, in the case of rurally located casinos, with small local populations, a large proportion of the casino's customers are likely to have driven longer distances, relative to patrons at urban casinos. Therefore, we might expect miles driven and the number of alcohol-related fatal accidents following the introduction of a casino to be greater in rural than in urban areas. To the extent that casinos – either rural or urban – attract new tourists to a particular area, then we would expect an increase in miles driven. Overall, we believe that the *net* impact of casino introduction on alcohol-related traffic risk will depend on the population or "urbanicity" of the area where the casino locates, and this hypothesis is reflected in our empirical specification.

In the remainder of the paper, we investigate whether these theoretical predictions are verified by observing the how local alcohol-related fatal accidents were impacted by casino entry. We find substantial evidence that the number of fatal accidents involving alcohol is impacted by casino entry, but the magnitude and direction of the effect is indeed dependent on the size of the local population.

3. Data and methods

In order to analyze any relationship that might exist between casinos and alcohol-related fatal accidents (ARFAs, hereafter), we must choose appropriate data. Although data are readily available at a state level, such aggregation would likely not foster a good analysis since many states with casinos have few of them, which means the locations of the casinos would be a necessary control for the analysis. County-level data are available on casinos and on ARFAs, and we view this to be the ideal level for our analysis.

3.1. Casino and fatal accident data

The vast majority of the expansion in the U.S. casino industry occurred during the 1990–2000 period. Between 2000 and 2008, only one state (Pennsylvania) legalized commercial casinos. We are interested in analyzing whether and how the spread of casinos has affected ARFAs, so like most casino-focused studies we choose the 1990–2000 period of time for our analysis. A set of 131 counties saw casinos open within their borders between 1990 and 2000. These casino counties represent the treatment group for our primary estimates.[5] We link these data on casino location to data on fatal vehicle crashes obtained through the National Highway Traffic Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS).[6] Our primary variable of interest is the annual number of fatal accidents in a county for which a driver's imputed blood alcohol content (BAC) exceeds 0.08. The legal maximum BAC is set by state government and every state currently has a maximum legal BAC of 0.08.

Although Federal law requires that BAC levels be obtained from every fatal crash, this is frequently not done and can lead to substantial bias in any estimation. The NHTSA is aware of this issue and provides imputed measures of the BAC for all drivers who were not tested. The NHTSA creates the imputed values using a multitude of characteristics in each case, including factors such as time of day, day of week, contents of the police report, and position of car in the road (NHTSA, 2002).[7] While previous studies using counts generated from older FARS data used imputed values based on discriminant analysis, or relied on counts generated from accidents that were more likely to be alcohol-related (e.g., crashes on weekend evenings), more recent studies use data generated by this new NHTSA procedure (e.g., Villaveces et al., 2003; Hingson et al., 2005; Cummings et al., 2006).

drinks, and our anecdotal research suggests this is not the case. We do, however, recognize this limitation of our analysis.

[4] A "problem gambler" is defined as a person that gambles to such an extent that it disrupts their professional or personal life. Psychologists have estimated that about 1–3% of U.S. adults have a gambling problem (American Psychiatric Association, 1994). However, it is beyond the scope of our study to address the various levels of problem gambling severity.

[5] For clarity, Atlantic County, NJ and all counties in Nevada were excluded from the analysis due to the unique nature of the casino industry in these areas. Results are robust to this restriction. The list of treatment casino counties is available from the authors upon request.

[6] To be clear, the NHTSA reports fatal accidents on all roadways, not just "highways."

[7] This follows suggestions from Rubin et al. (1998) and improves on the former procedure based on discriminant analysis (Klein, 1986; NHTSA, 2002).

Table 1
County-year means and proportions of key variables in balanced-sample analysis.

	All counties	Casino counties	Non-casino counties
Number of annual fatal accidents involving a driver with a blood alcohol content (BAC) above 0.08	31.83	39.29	30.51
Number of fatal accidents involving a driver with a positive blood alcohol level	37.71	46.54	36.15
Number of fatal accidents involving no alcohol	63.89	78.52	61.30
Population (unweighted, from U.S. Census Bureau)	150,471	270,803	139,501
County unemployment rate (from Local Area Unemployment Statistics)	5.68%	5.98%	5.63%
Prevailing beer tax per gallon (in 2000 dollars)	$0.24	$0.23	$0.24
BAC law specifying minimum of 0.08	29.1%	36.03%	27.84%
Zero-tolerance laws	56.23%	59.48%	55.66%
Number of observations (number of counties)	17,248 (1,568)	1,441 (131)	15,807 (1,437)

Notes: (1) As the primary estimation is weighted by county population, the above means and proportions are weighted similarly, unless noted. (2) To maintain consistency with the primary sample utilized in the analysis, the above values are from a balanced sample of counties, and they exclude data from the state of Nevada and from Atlantic County, NJ.

We aggregate NHTSA counts of fatal accidents involving a driver with a BAC content exceeding 0.08 by county and year. We can link annual fatal accident counts to other available county-level annual data (i.e., population data from the Census Bureau). Moreover, annual counts provide us with a sufficient number of accidents for each county upon which to base the analyses.

Unfortunately, county authorities sometimes fail to report any accident data for a particular year, leaving us with an unbalanced panel. For our main estimates we include only counties for which FARS data were available for all 11 years of our analysis (1990–2000). We do, however, test the robustness of this restriction. Table 1 reports means and proportions of variables included in the analysis for both the treatment counties and counties without a casino. The second column in the table, casino counties, includes all county-year observations for counties that have a casino present within their borders for at least 1 year in the sample time period. In many cases there are small differences between the treatment and control counties, although some variables, such as county population and the prevailing beer tax, are very similar. There are two notable differences between the casino and non-casino counties. First, higher unemployment rates are observed in the treatment counties. This is consistent with the idea that some municipalities or states attempt to utilize casinos as a form of economic development in depressed areas. The second difference is that there is a larger number of fatal automobile accidents (alcohol-related and non-alcohol-related) in the casino counties.

3.2. Methodology

We first pool a balanced sample of all of the counties in which a casino was open (the treatment group) and the remaining counties in the U.S. that did not have a casino present during the sample period (the control group). We experiment later with alternative samples and the results prove robust. Our basic analysis begins with the following fixed effects regression model:

$$\mathrm{ARFA}_{ct} = \alpha_c + \tau_t + \beta_1 C_{ct} + \beta_2 P_{ct} + \beta_3 CP_{ct} + \gamma' X_{ct} + \varepsilon_{ct}, \quad (1)$$

where subscript c denotes counties and t denotes years. ARFA is the number of alcohol-related fatal accidents; α_c and τ_t are county and time fixed effects, respectively; C is a dichotomous variable indicating the presence of a casino; P is the log of county population; CP is an interaction term between the casino variable and the log of the county population; X is a vector of additional variables, explained in more detail along with the other variables, below; and ε is the error term.

ARFA is defined in most estimates as the log of the number of fatal accidents involving a driver whose measured BAC exceeded 0.08 in a given county-year cell. Specifically, in constructing ARFA we add one to the number of ARFAs in each county-year to prevent losing the very small counties that may have zero accidents when the values are logged. Results prove robust to this approach. We judge logs to be the most appropriate scale for the dependent variable because the median estimated number of fatal accidents for the county-years in the sample is less than the mean.

Given that the number of accidents may be highly variable in smaller counties and that we use data aggregated to the county-year level, we weight the OLS estimates by county-year population size obtained from the Census Bureau. Estimation of Eq. (1) will therefore use weighted least squares (WLS). We also correct all standard errors to allow for non-independence of observations from the same state through clustering. This follows Arellano (1987) and Bertrand et al. (2004). We show later that redefining the dependent variable or using a different estimation model yields qualitatively identical results.[8]

Variable C is a county indicator that is set to one if the county has a casino present in a given year.[9] Variable CP is the interaction of the casino dummy and the log of the county population. To allow for a more meaningful interpretation, we will also estimate CP as the interaction of the casino dummy and the demeaned log of the county population. Thus, the estimate of β_3 can be read as an estimate of the percent increase in ARFAs after a casino opens in a county with an average log population, relative to a control group of counties that did not have a casino open at any point during the sample period. As mentioned earlier in the paper, we believe that drinking and driving outcomes are likely to be affected by the population of the counties impacted, hence variable CP, capturing the casino-population interaction, will help to identify whether such a relationship does exist.[10]

The inclusion of county fixed effects (α_c) and time fixed effects (τ_t) are imperative to proper identification when utilizing this empirical research design. Specifically, the inclusion of county fixed effects captures differences in accident prevalence across coun-

[8] For example, a Poisson regression (Hausman et al., 1984) could be used given the discrete measurement of the dependent variable (before logging). Given the potential over-dispersion of the dependent variable, however, the Poisson might be inappropriate. Therefore, a negative binomial model might be more appealing, but the conditional negative binomial model correcting for over-dispersion has recently been criticized on the grounds of failing to be a true fixed effects estimator (Allison and Waterman, 2002). We settle on weighted least squares as the least problematic and most easily interpretable measure to use in presenting the basic results. We conducted a multitude of robustness checks to ensure our choice of model is not driving the result, many of which are later reported in Table 4.

[9] We recognize that utilizing a dichotomous variable to indicate whether there is a casino present in a county or not ignores any differences in the size of the casino environment across counties and over time. Unfortunately we were unable to obtain any reliable or comprehensive measure of casino size at the county level or for individual casinos. This is a limitation of our analysis.

[10] It is important to note that the inclusion of the log of population is equivalent to the inclusion of the log of population per square mile, given that county fixed effects are included and that the area size of counties does not vary over time.

ties that are time-invariant. Therefore, the inclusion of fixed effects allows us to compare counties with persistent differences in accident prevalence, without concern that these differences will impact our estimates. On the other hand, time fixed effects capture changes in accident prevalence over time that is common in all counties.

We recognize the recent empirically rigorous studies that evaluate the determinants of drunk driving (e.g., Dee, 1999; Baughman et al., 2001; Eisenberg, 2003) and understand that our empirical strategy should isolate the impact of casinos from the other determinants of ARFAs. We know that population growth will likely increase the number of accidents, so one control is the log of the county's population (P), obtained from the Census Bureau. Although we think casino openings are likely exogenous in the context of our study, there may exist some correlation between casino presence and some other factors. Our empirical approach addresses this in a number of ways. First, the county fixed effects capture differences in counties that might affect accidents and are constant over time. We also add various covariates that capture county-specific changes in a county's ARFAs over time and include them in the X vector.

Second, Ruhm and Black (2002) showed that downturns in the economy have a small negative net impact on drinking behavior. So, county unemployment rates collected from the Local Area Unemployment Statistics (LAUS) program are included in X.

Third, we are concerned that there may be an underlying propensity for *all* traffic accidents to change in a county (or state) over time because of differences in speed limits, gas prices, general economic activity, highway construction, weather patterns, insurance rates, or other factors that might confound the interpretation of our estimates of ARFAs. To capture these, we employ an approach employed by Adams and Cotti (2008), which utilizes the log number of accidents per county that were *not* alcohol-related (also measured in the FARS data). This control isolates the effect of the independent variables (including the casino variables) apart from the many potentially omitted factors that make it more dangerous to drive in any particular locality. Given that this captures underlying traffic trends in the data, it would capture any differences in general accident risk that may arise between the treatment and control groups during the sample period analyzed, and as such is a very powerful control.

Another issue that must be addressed in this analysis is the concern that the opening of a casino in a county is correlated with other government policies that are meant to deter drunk drivers. We use data from 1990 to 2000, however, which is a time period beyond the point that most states had engaged in most of their legislative activity aimed at deterring drunk driving. For example, since 1988 the minimum legal drinking age has been 21 in all states. This alleviates the concern that casino passage tended to coincide with legislation aimed to deter intoxicated drivers. The fact that our sample includes casinos from every region of the U.S. further supports the experimental nature of our study.

Nevertheless, during our sample period, there were three state-level variables that changed enough to raise concern that they might confound the interpretation of the estimated casino effect. First, a number of states lowered the minimum BAC used to determine whether a driver was legally intoxicated, from 0.10 to 0.08. Table 1 shows that more counties in our treatment group than the control group were affected by this reduction. Dee (2001) and Eisenberg (2003) use somewhat older data to show that stricter BAC requirements reduce drunk driving accidents. For this reason, we include controls for whether the county is located in a state that had a 0.08 statute for a given year; the remainder of the counties had 0.10 BAC laws during this time period. Second, many states passed zero-tolerance laws on teen drivers during our sample time-frame. Carpenter (2004) shows that these laws play an important role in reducing drinking and driving among young drivers, so we include a dummy variable indicating if a state had a zero-tolerance alcohol policy in place. Third, alcohol excise taxes varied over our sample period, as some states increased or decreased their rates. Ruhm (1996) finds beer taxes to be effective in deterring drunk driving for at least a subset of the population. Eisenberg (2003), however, finds limited evidence of such an effect from beer taxes. We include controls for the log of beer taxes (in 2000 dollars) to capture any tax effect. However, a look at Table 1 shows little differential variation in beer taxes between the treatment and control states.

There are obviously other minor state and local laws and regulations aimed at deterring drunk driving, many of which might be effective in certain areas. We find that adding control variables for BAC laws, zero-tolerance policies, and beer taxes does not substantially change our estimated casino effect. So, if these much more visible and effective policies are not correlated with the introduction of casinos, it is unlikely our results would be affected by less visible policies.[11]

4. Results

4.1. Basic results

We begin by estimating Eq. (1) for a balanced sample of all the treatment and control counties. Results are shown in column (1) of Table 2 and indicate that, for counties of near the mean logged population, the opening of a casino increases alcohol-related fatal accidents (ARFAs) by a statistically significant 9.2%. Consistent with our expectations, the casino-population interaction shows that this effect declines as population size increases. Recall, we estimate the casino effect where the casino-population interaction is defined as the interaction of the casino dummy and the demeaned log of the county population.[12] So, the estimates on the casino and casino-population interaction variables provide evidence that casino presence does impact ARFAs, but the population of a county determines the magnitude and the direction of the effect. For example, the estimates in Table 2, column (1) suggest that smaller/rural counties with casinos, such as Sauk County, WI (average sample population = 17,339; log population = 9.76) would see a statistically significant increase in ARFAs of 16.9% (p-value = 0.014), while much larger/urban counties with casinos, such as Milwaukee County, WI (average sample population = 936,589; log population = 13.75) would see a statistically significant *decline* in ARFAs of 6.1% from the introduction of a casino (p-value = 0.064). In light of our earlier theoretical discussion of the possible effects of casinos on ARFAs, our results may indicate that in rural counties, casinos tend to increase miles driven by intoxicated drivers (potentially from residents of the county and by out-of-county visitors), and therefore make ARFAs more likely. In urban settings, however, it appears that this effect may be more than offset by a substitution of casino patronage for other drinking establishments, coupled with other aspects of urban living, such as a much greater availability of public transportation.

With regard to the other variables in the regression, as expected, all else equal, population growth increases the number of accidents. Also as expected, the number of fatal accidents involving no alcohol is also positive and highly significant. We believe this captures the general accident trend in a county, which is driven by factors that impact the relative driving danger of an area separate from alcohol,

[11] We also included interaction terms of the casino variable and the policy variables. However, none of these interaction terms was significant and they did not affect the overall results.

[12] Average (unweighted) log population in the sample is 11.095.

Table 2
Effects of casino entry on ARFAs, 1990–2000.

Explanatory variables	Dep. variable: Nat. log alcohol-related fatal accidents (ARFAs) WLS	
	(1)	(2)
Casino dummy (*C*)	0.092**	0.117***
	(0.041)	(0.041)
Casino-population interaction (*CP*)[a]	−0.058**	−0.081***
	(0.023)	(0.028)
Border county dummy (*B*)	–	0.107***
	–	(0.033)
Border county-population interaction (*BP*)[b]	–	−0.069***
	–	(0.017)
Nat. log county population (*P*)	0.488***	0.449***
	(0.171)	(0.175)
Nat. log non-alcohol-related fatal accidents	0.148***	0.135***
	(0.031)	(0.024)
Zero-tolerance law dummy	−0.052**	−0.056***
	(0.021)	(0.020)
0.08 blood alcohol content (BAC) dummy	0.034	0.029
	(0.044)	(0.038)
Nat. log beer tax (in 2000 dollars)	−0.087	−0.069
	(0.074)	(0.069)
Nat. log county unemployment rate	−0.085*	−0.095*
	(0.051)	(0.054)
Observations	17,248	17,248
Counties	1568	1568
States	50	50
R-squared	0.940	0.941

Notes: (1) Robust standard errors are in parentheses. (2) Estimates are clustered at the state level to allow for non-independence of observations from the same state. (3) Estimates are weighted by county population. (4) Nevada and Atlantic County, NJ have been excluded. (5) Only counties where observations were available for all 11 years are included.

[a] The casino-population interaction is demeaned for interpretation at a meaningful population and is defined as (casino dummy) × [ln(population) − ln(mean population)].

[b] The border county-population interaction is demeaned for interpretation at a meaningful population and is defined as (border county dummy) × [ln(population) − ln(mean population)].

* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

such as road construction or weather. It is important to note that, although changes in non-alcohol-related accidents are highly correlated with ARFAs, the effect of the casino and casino-population interaction is still significant.[13] Estimates on the remaining controls are as anticipated or are insignificant.

The identification strategy utilized to this point is predicated on the assumption that after the inclusion of fixed effects and time-varying controls, the casino counties are comparable to the non-casino counties. Yet, even though we have controlled for changes in non-alcohol-related trends, there is always the concern that casino openings are somehow correlated with some unobserved trend in ARFAs. Although we view this to be unlikely, in light of the aforementioned controls and the exogenous nature of casinos with regard to drunk driving, we do test for the presence of such a correlation in two ways. First, we fail to reject the null hypothesis that the pre-casino trends of ARFAs in the treatment and control groups are identical, thus providing no evidence to indicate that there is a difference in accident trends between the control group and treatment group in the years prior to casino entry (p-value = 0.562). Second, we look at the effect of casinos over time by introducing lead and lagged effects, as well as a contemporaneous effect of the casino entry. The lead effects are informative in that we can determine whether the estimates of the casino dummy variable (*C*) are indeed stemming from the opening of casino, as opposed to the effect of a previously existing trend. The results, presented in Table 3, indicate the expected pattern as the lead effects are not significant and have opposing signs, while estimates only become statistically significant and consistently positive after the casino opens.[14] Overall, these results provide no evidence to suggest that the estimates in Table 2, column (1) are the result of trending differences between the treatment and control counties; instead they appear to be real effects of casinos.

4.2. Robustness checks

Although we view our empirical decisions thus far as reasonable, we recognize there are several alternative definitions of the sample, the dependent variable, the policy variables, and estimation methods that we could have employed. In order to verify that the results are not sensitive to our choices, we next engage in a series of robustness checks, which we summarize in Table 4. For comparison, row (1) repeats the primary results from Table 2, column (1), a 9.2% increase in ARFAs after casino entry, with a −0.058 estimated coefficient on the demeaned casino-population interaction.

Our first set of robustness checks tests the robustness of our chosen estimation model. We have been using weighted least squares

[13] One could envision a falsification exercise where the log of non-alcohol-related accidents is the dependent variable. However, we find no evidence of a casino effect on accidents with no alcohol involved (Coef. = 0.019, SE = 0.035). Likewise, the estimated effect of the casino-population interaction is both statistically and absolutely insignificant (Coef. = −0.001, SE = 0.018). It is only the *alcohol*-related crashes that are impacted by casino entry.

[14] A test of the joint significance of leads fails to reject the null hypothesis that leads jointly equal zero (p-value = 0.5506). Test of the joint significance of lags successfully rejects the null hypothesis that lags jointly equal zero (p-value = 0.0636).

Table 3
Effects of casino entry on ARFAs, leads and lags.

	Dep. variable: Nat. log alcohol-related fatal accidents (ARFAs) WLS Casino year effects
Lead 3 years+	0.049
	(0.070)
Lead 2 years	−0.074
	(0.063)
Lead 1 year	−0.036
	(0.078)
Year of casino opening	0.057
	(0.052)
Lag 1 year	0.126**
	(0.046)
Lag 2 years	0.090
	(0.060)
Lag 3 years +	0.126**
	(0.059)
p-value: test joint significance of leads	0.5506
p-value: test joint significance of lags	0.0636*
Observations	17,248
Counties	1568
States	50
R-squared	0.940

Notes: (1) Results are analogous to those presented in the first column of Table 2. Hence, all control variables from Table 2, column (1), as well as interactions between the lead/lag dummies and log of demeaned population were included in this regression. (2) Robust standard errors are in parentheses. (3) Estimates are clustered at the state level to allow for non-independence of observations from the same state. (4) Estimates are weighted by county population. (5) Nevada and Atlantic County, NJ have been excluded. (6) Only counties where observations were available for all 11 years are included.

* $p < 0.1$.

** $p < 0.05$.

estimation with a log transformed dependent variable. However, several alternative estimation methods are also potentially good options. For example, given the discrete count-nature of the accident data, a Poisson approach may be appropriate. Row (2) of Table 4 provides estimates using a fixed-effect Poisson estimation approach and shows similar inference to the WLS estimates.[15] Next we note that frequently in the accident literature the dependent variable will be divided by a measure of population to generate an accident rate and a logit or probit approach will be utilized. In row (3) we have taken this approach, using a probit model to estimate the effects of casino entry. Again results prove robust as the estimated marginal effects are very similar to the WLS estimates. The last alternative estimation approach tests the sensitivity of the basic results to the use of county fixed effects. We recognize that three of the control variables we use are measured at the state level: beer tax, zero-tolerance laws, and lower BAC requirements. In row (4) we employ state rather than county fixed effects; the estimates remain very similar to our original estimates.

Next, we checked the robustness of our chosen specification. First, to this point, we have considered a county to be a "casino county," with the casino dummy variable equal to one if a casino was open within a county's borders at any point during a calendar year. We could have weighted the casino dummy differently for the first year a casino is present in a county, because the impact may be lessened if the casino was not operating for the entire year. Alternatively, we could have considered a county as only having been affected by the casino's presence for a given year if the casino was present before the beginning of that year. So, in order to test our results to the sensitivity of the first year weighting we generate estimates where the year the casino opens is given half-weight ($C = 0.5$) or no weight ($C = 0$). As detailed in rows (5) and (6) of Table 4, the overall impact of casinos remains both quantitatively and qualitatively the same regardless of how we treat the casino dummy variable and the corresponding casino-population interaction during the first year of a casino presence. Next we consider the robustness of our dependent variable definition. Instead of using the log of ARFAs where driver BAC exceeded 0.08, we could have chosen the log number of fatal accidents involving any alcohol. When we do this the outcome is nearly the same, as shown in row (7).

In our final set of robustness tests, we test whether the sample group we have been using is unduly influencing the results. We test three alternative samples. In the first alternative, we restrict the control group to only those states with a casino present at some point during the sample time-frame (1990–2000). From the perspective of cultural or regional driving norms, the non-casino counties from states with some casino presence may provide a better control group.[16] The results of this test are reported in row (8); the story remains virtually unchanged. Next, on a similar theme, we used a logistic regression to calculate propensity scores for each county as a means of matching the treatment counties to the most similar control counties in the sample. Results of this examination are presented in row (9) and also prove robust, albeit less precisely measured. Finally, thus far we have been using a balanced sample of counties, which has imposed a strong restriction on the data. So, in our last robustness check we replicate the analysis from Table 2, column (1), utilizing the much larger unbalanced sample. Although the estimated effect of casino entry on the mean population is larger, the inclusion of these additional counties does not alter our qualitative findings.

Overall, the results detailed in Table 4 provide us with a broad and comprehensive picture of the nature of the measured effects. Under most of the alternatives, we estimate an effect that is slightly stronger than the basic estimates. Under a few of the alternatives, the precision is smaller, but, regardless of empirical assumptions, the qualitative conclusions of the primary model remain intact. We therefore regard our results presented in Table 2, column (1) as being robust and fairly conservative estimates for the impact of casinos on ARFAs.

4.3. Border county analysis

In Section 2 of the paper we advanced several potential mechanisms that might explain how opening a casino might impact alcohol-related fatal accidents. One such mechanism for an increase in drunk driving rates comes from the existing literature on consumer behavior which suggests that small differences in consumer utility can prompt changes in driving habits. In particular, if casinos act as a destination and attract people from a wide area, we could see an increase in accident deaths in counties near a casino county, as well as in the county in which the casino is located. Returning to Table 2, we address this possibility by testing for casino effects on fatal accidents in counties adjoining the casino counties. If there are increases in ARFAs in the adjoining counties after casinos open, this is suggestive that people are driving greater distances in response to this change in their incentives.

Our specification of this analysis, presented in Eq. (2) below, is nearly identical to that presented in Eq. (1), except we now include

[15] Due to a limitation in the Stata programming, the estimation is not weighted and the standard errors from these estimates were clustered at the county, rather than the state level.

[16] For these estimates, we exclude counties from states such as Maine and South Carolina, which do not have any casinos present between the years 1990 and 2000.

Table 4
Robustness checks of the basic results.

	Model	Casino dummy (*C*)	Casino-population interaction (*CP*)[a]
(1)	Basic specification (repeated from Table 2, column 1)	0.092**	−0.058**
		(0.041)	(0.023)
	Alternative estimation method		
(2)	Unweighted Poisson fixed effects	0.088***	−0.068***
		(0.029)	(0.015)
(3)	Fixed effects probit (dep. variable is ARFA rate) (marginal effects shown)	0.069**	−0.049**
		(0.029)	(0.020)
(4)	State fixed effects (instead of county)	0.097**	−0.048*
		(0.046)	(0.028)
	Alternative specifications		
(5)	Casino dummy given half-weight during year casino opened, one thereafter	0.107**	−0.061**
		(0.050)	(0.024)
(6)	Casino dummy given zero-weight during year casino opened, one thereafter	0.099**	−0.053**
		(0.050)	(0.021)
(7)	Dep. variable is log of number of accidents involving any alcohol	0.096**	−0.054**
		(0.042)	(0.023)
	Alternative samples		
(8)	Only counties from a state with a casino (1,002 total counties)	0.099**	−0.055**
		(0.047)	(0.022)
(9)	Propensity score analysis (701 counties)	0.133*	−0.109**
		(0.072)	(0.048)
(10)	Unbalanced panel (3114 total counties)	0.120**	−0.054**
		(0.048)	(0.021)

Notes: (1) Each row represents a separate regression on the dependent variable ARFAs. County and year fixed effects, as well as controls for accidents not involving alcohol, population, beer tax, a zero-tolerance dummy, the local area unemployment rate, and minimum BAC levels are included in all regressions. For the sake of brevity, these other variables are not shown here. Unless otherwise noted, the number of counties in consistent: 1568.
(2) Coefficient estimates and robust standard errors (corrected to allow for non-independence of observations within a state through clustering) are reported.
[a] (Casino dummy) × [ln(population) − ln(mean population)].
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

variable *B*, which is a dummy variable that is equal to one if a county borders a county with a casino, and variable *BP*, which is an interaction between the border county indicator and county population:

$$\text{ARFA}_{ct} = \alpha_c + \tau_t + \beta_1 C_{ct} + \beta_2 P_{ct} + \beta_3 CP_{ct} + \beta_4 B_{ct} + \beta_5 BP_{ct} + \gamma' X_{ct} + \varepsilon_{ct} \quad (2)$$

This specification allows for two distinct treatment groups, counties with a casino and counties that border counties with a casino, and a control group that consists of all remaining counties. This approach provides us not only the ability to estimate if any potential spillover effects of casinos exist in bordering counties, but, in the event spillovers are present, to also re-estimate the impact of casinos on drunk driving accidents in the casino counties against a potentially more appropriate control group.

Results presented in the second column of Table 2 indicate that, for counties of near the mean logged population, the opening of a casino increases ARFAs in border counties by a statistically significant 10.7% and in the casino county itself by 11.7%. Moreover, both the county-population interaction variables are negative and significant, indicating that again the size of the county plays an important role in outcomes. We should point out that, while the estimated border county interaction suggests that highly populated border counties could see a decline in ARFAs, given on the actual border county populations, these estimates would predict an *increase* in ARFAs in nearly 90% of the border counties in the sample. With this in mind, these results suggest that there are generally relevant spillover costs onto neighboring counties, as residents seem to drive to and from casinos.

Overall, findings from this border county analysis seem to indicate that increases in visitors from nearby areas are at least partially responsible for any net increases in ARFAs observed in the casino counties. And, from a policy perspective, this result suggests that jurisdictions that border casino counties should be aware of a heightened risk of drunk drivers returning along major highways from the locations which have operating casinos.

5. Conclusion

This paper is the first of which we are aware to show that casinos impact the fatal accident risk posed by drunk drivers. Specifically, we find that the magnitude and direction of the effect is dependent on the size of the population where the casino is opened. Thus, on average, rural or moderately sized counties will likely see an increase in alcohol-related fatal traffic accidents when casinos are present, but urban or greater-than-average populous counties may be expected to see a decrease in alcohol-related fatal traffic accidents when casinos are present. Among other factors, we believe the net effect lies in the tradeoff between increases in the total number of miles driven while intoxicated in a county (increasing risk), and the potential that casinos may act as a substitute to other venues at which alcohol may be served (decreasing risk), with the former being stronger in all but the most urban areas.

We have shown that this result is robust to the inclusion of controls for area and time fixed effects, changes in population, changes in other policies that may impact drunk driving behavior (e.g., beer taxes, BAC laws), as well as changes in factors that may influence overall driving risk separate from drinking behavior (e.g., construction, weather). Furthermore, these estimates are also robust to several alternative definitions of the control group, the dependent variable, and to the estimation method selected (e.g., weighted least squares, Poisson, probit). Lastly, evidence from an analysis of border counties is consistent with the idea that the dispersed nature of casinos creates a destination effect – particularly

in less urban areas – that attracts people from surrounding jurisdictions to drink and gamble, which leads to an increase in ARFAs in the casino county, as well as in the bordering counties.

Overall, this study provides an important new piece of information on the effects of casinos on local communities. This information can be helpful to jurisdictions currently weighing the casino option, as well as existing casino jurisdictions attempting to address the social impacts from casinos. In particular, we hope that this study will provide increased awareness about the potential problems that casino introduction can create, especially on rural highways, and that local communities will take the appropriate steps necessary to increase the private costs associated with the decision to drink and drive.

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