

Measuring public policy: The case of beer keg registration laws

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Abstract

Although there are many valuable evaluations of alcohol control policies, most do not account for the complexities of the policies, such as variability across jurisdictions, conceptual multi-dimensionality, implementation procedures and enforcement mechanisms. We conducted a detailed analysis of state beer keg registration policies in US. Based on reviews of keg registration statutes and regulations and surveys of alcohol beverage control agency officials in each of the 21 states with a keg registration law, three independent coders examined seven core conceptual components. Laws varied considerably in statutory and regulatory provisions and implementation procedures. No state specifically provided for enforcement, education or training regarding keg registration laws, and most did not fully specify penalty or benefit provisions. Future policy evaluation studies should include reliable coding of multiple policy dimensions and characteristics, and incorporate continuous measures of policy quality, not a simple dichotomy indicating presence or absence of a policy.

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1. Introduction

Thorough evaluation of the effectiveness of public policies can be challenging. Most published studies of a particular policy measure policies dichotomously (specific policy exists vs. specific policy does not exist). Although these evaluations are valuable, they do not take into account the legal and operational complexity of the laws, such as how they vary across jurisdictions, their multi-dimensionality, and aspects of their implementation procedures and enforcement mechanisms. For this study, we conducted a detailed analysis of state beer keg registration policies in the United States, illustrating the complexity of measuring the independent variables in policy evaluation studies.

We chose to analyze beer keg registration laws because it represents a policy type that is of increasing interest to prevention professionals and activists working to decrease underage drinking. Beer keg registration laws or regulations require unique tags or marks on returnable, bulk-sale

containers of beer sold for private use. The goal is to directly control, through an authorizing agency, both the purchase and sale of kegs, primarily to identify and penalize beer keg vendors who improperly sell alcohol to youth or adults who purchase beer kegs they later make available to underage youth. The laws typically require sellers of beer kegs to: (1) collect and record key information about the purchaser (typically including name, address, and driver's license number), (2) mark each beer keg with a tag containing a unique identification number, and (3) retain purchaser information along with the keg identification number for a designated period of time. As of September 10, 2002, 21 states had registration laws in an attempt to reduce youth access to alcohol from these sources (according to data available in the legal database compiled by The West Group, Eagon, MN; available with subscription at <http://westlaw.com>).

Often, beer keg laws are enacted following widely publicized incidents of drink-driving fatalities involving minors who attended beer keg parties. For example, after a 16-year-old girl from Georgia died in a car crash following a keg party at which she consumed beer, the Georgia General Assembly passed a law 'requiring keg buyers to present state identification and to sign an affidavit listing the location where the keg is to be consumed and acknowledging that it is illegal to furnish beer to minors' (Jones, 2002).

Like most alcohol policies, keg registration laws can be implemented at the local level (via city, township or county

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ordinances), the state level (via statutes or regulations), and the federal level (although no national laws on beer keg registration exist at present; Wagenaar & Toomey, 2000). Keg registration was first implemented at the local level (Hammond, 1991); however, these local laws permitted purchases in nearby towns where registration of beer kegs was not required. Many local citizen groups then moved to obtain statewide legislation requiring keg registration (Nachbar, 2001).

There is a large base of research suggesting the potential importance of keg registration laws, and providing the rationale for examining multiple components of the laws. All of the leading causes of morbidity and mortality among teenagers are one-third to one-half attributable to alcohol (National Center for Injury Prevention and Control, 2001; Smith, Branas, & Miller, 1999). The particularly high long-term developmental risks of drinking in early adolescence are well established (Hingson, Heeren, Levenson, Jamanka, & Voas, 2002; Monti et al., 2005). The transition from ‘trying’ alcohol to intoxication in the early teens is typically related to access to large quantities of alcohol at very low cost attendant to parties where kegs are frequently available (Wagenaar, Finnegan, Wolfson, Anstine, Williams, & Perry, 1993). Controlled evaluations of previous policies designed to reduce youth access to alcohol (e.g. increasing drinking age to 21) have shown significant effects on teen drinking and mortality rates (see Wagenaar & Toomey, 2002 for a review of over 100 studies).

For this study, we analyzed state keg registration policies in US to determine core conceptual dimensions and variations in the laws. Our specific objectives included: (1) identify states with keg registration laws; (2) describe core conceptual dimensions on which such laws vary from state to state; (3) assess reliability of coding values for each dimension and test procedures to increase reliability of policy coding; (4) illustrate the multidimensionality of alcohol control policies, the inadequacy of dichotomous measures in policy evaluation studies, and the need for more complex multi-component measures of public policies; and (5) provide a description of variations in extant keg registration laws. Our results will assist advocates and policymakers in constructing high-quality keg registration laws, aid researchers and policymakers in carefully evaluating the strengths and weaknesses of alcohol policies, and we hope, increase attention to the multi-dimensional measurement of public policies in policy evaluation studies across all topics.

2. Methods

2.1. Statutes and regulations

To determine whether a state had a beer keg registration law in effect as of 10 September 2002, we used several databases in Westlaw, an on-line legal research service, to search for current and historical statutes and regulations. A state’s statutes

(legislation passed by state legislatures) carry the core provisions of a law, while its regulations (rules adopted by state agencies, where the agency has legislated power to adopt such rules) specify the particulars of those provisions.

We also collected the full text of other significantly related laws that were either referenced in the text of keg registration laws or were referred to us by state agency staff. We identified appropriate agencies and staff via the National Conference of State Liquor Administrators website (www.ncsla.org). In many cases, states with existing keg laws had both statutes and regulations specific to keg registration. Several also had other clearly relevant statutes and regulations. However, to maintain consistency of analyses across states, we included only provisions that were specifically mentioned in the primary keg law and excluded penalty provisions that appeared separately in the criminal code but were not specifically referenced in the primary law (see Table 1 for legal citations for each state).

After identifying and obtaining existing keg registration laws, we specified seven core conceptual components of the laws based on prior knowledge of alcohol policy and initial readings of the 21 extant laws: (1) target (to whom does the law apply?); (2) administrative features (what information and actions are required from the targets?); (3) enforcement (how will the law be enforced?); (4) penalties (what are the penalties for violating the law?); (5) education (how will targets learn about provisions of the law?); (6) benefits (how will targets benefit from compliance with the law?); and (7) miscellaneous other provisions. Since there is no previous literature on the dimensions of keg laws, we combined the deductive principles from three scientists with a long history conducting dozens of alcohol policy studies with the inductive principles from an attorney with considerable experience with alcohol law, who read and studied all the individual laws. The result was the seven conceptual domains used here.

2.2. Surveys, registration forms, and keg tags

Because statutes and regulations often do not explicitly specify the details of a policy, we sought further information in administrative forms and procedures. Where possible, we collected and examined standardized registration forms and keg ‘tags’ used in each state and conducted a survey of state agency personnel most familiar with laws relating to beer keg registration. Not all states standardize their forms and tags and some agency staff did not respond to our requests for interviews and examples of forms and tags (see Table 2 for sources of information used for each state).

2.3. Coding

For each state, across the seven broad conceptual categories of keg policies, three independent coders—a research attorney, a graduate student in law school, and a graduate student in public health—read the laws and coded 91 specific data elements (Table 3). We calculated

Table 1
Keg registration statutory and regulatory provisions [referenced relevant laws^a in brackets]

State	Legal citations (S, statute, R, regulation)	Effective date
California	(S) Cal. bus and Prof. Code § 25659.5	1/1/1994
Connecticut	(S) Conn. Gen. Stat. Ann. §§ 30-114, 30-115	1/1/1999
	(R) Conn. Agencies Regs. §§ 30-6a-G1, 30-6a-G2	4/5/1999
	(S) [Conn. Gen. Stat. Ann. § 30-55]	
District of Columbia	(S) D.C. Code Ann. § 25-753	9/11/1993
Georgia	(S) Ga. Code Ann. § 3-5-5	7/1/2001
	(R) Ga. Comp. R. and Regs. 560-2-4-09	
	(S) [Ga. Code Ann. §§ 3-3-9, 3-3-23]	
Idaho	(S) Idaho Code § 23-1018	7/1/1981
	(R) Idaho Admin. Code 11.05.01.012	8/1/1995
	(S) [Idaho Code § 23-1038]	
Indiana	(S) Ind. Code §§ 7.1-3-6.5-1 thru 7.1-3-6.5-6	7/1/2003
	(S) [Ind. Code § 7.1-3-23-3]	
Kansas	(S) 2002 Kan. Sess. Laws 44 (slip copy)	7/1/2002
	(S) [Kan. Stat. Ann. §§ 41-102, 41-320, 41-328, 41-2708, 41-2711]	
Maine	(S) Me. Rev. Stat. Ann. tit. 28-A, § 714	10/9/1991
	(S) [Me. Rev. Stat. Ann. tit. 28-A, §§ 751, 754 (Ch. 31)]	
Maryland	(S) Md. Alc. Bev. Code Ann. Art. 2B, § 21-106; Art. 27, § 401B	10/1/1994
Massachusetts	(R) Mass. Regs. Code tit. 9, §§ 9.00 - 9.09	7/2/1993
Minnesota	(S) Minn. Stat. 340A.513	8/1/2002
Nebraska	(S) Neb. Rev. Stat. §§ 53-167.01 to 53-167.04	6/9/1993
	(R) Neb. Adm. Rules and Regs. Tit. 237, Ch. 6, § 003	4/3/2002
New Hampshire	(S) N.H. Rev. Stat. Ann. § 179:5-a	1/1/2001
	(R) N.H. Code Admin. R. Liq. 506.06	4/3/2002
	(S) [N.H. Rev. Stat. Ann. §§ 179:5, 641:3]	
	(R) [N.H. Code Admin R. Liq. Part 603]	
New Mexico	(S) N.M. Stat. Ann. § 60-7B-12	6/16/1989
	(R) 15 NMAC 10.6.1 sec. 8.8, #303	
	(S) [N.M. Stat. Ann. Ch. 60, Art. 7B (§§ 60-7B-1, 60-7B-6, 60-7B-7, 60-7B-9), 60-6C-1, 31-19-1)]	
North Dakota	(S) N.D. Cent. Code § 5-02-07.2	7/1/1983
	(R) N.D. Admin. Code §§ 10-08-02-01, 10-08-02-02	9/1/1983
Oregon	(S) Or. Rev. Stat. § 471.478	1/1/1978
	(R) Or. Admin. R. 845-006-0441	1/1/1978
	(S) [Or. Rev. Stat. §§ 162.075, 471.410, 471.605]	
Rhode Island	(S) R.I. Gen. Laws § 3-8-15	6/14/2002
South Dakota	(S) S.D. Codified Laws Ann. §§ 35-1-11, 35-1-12	7/1/1991
Vermont	(S) Vt. Stat. Ann. tit. 7, §§ 64, 671	7/1/1992
Virginia	(S) Va. Code Ann. § 4.1-111	7/1/1992 ^b
	(R) 3 Va. Admin. Code 5-70-180	1/13/1993
	(S) [Va. Code Ann. § 4.1-225]	
	(R) [Va. Admin. Code 5-20-20B]	
Washington	(R) [Va. Admin. Code 5-30-30]	
	(S) Wash. Rev. Code Ann. §§ 66.28.200—66.28.250	7/1/1989
	(R) Wash. Admin. Code §§ 314-02-115, 314-02-120, 314-12-320	4/15/2000
	(S) [Wash. Rev. Code Ann. §§ 9.92.020, 66.16.040, 66.44.270]	2/13/1999

Legal citations are written in accordance with generally accepted legal citation style and refer to section numbers (§ section symbol) with the relevant legal publication.

^a Keg registration laws often reference other existing laws that are relevant to the keg law.

^b Va. Code Ann. § 4.1-111 is the statute that allows the Va. Board to create keg registration regulations. But the actual substance of the keg registration law was not created until the regulations were promulgated on 1/13/1993.

inter-rater reliability coefficients for each of the 91 items. Sixty percent of the individual items had very high reliabilities (0.80–1.00). Average reliability scores for the six conceptual policy components and three subcomponents of administrative features are all high (0.70+), given the complexity of the coding task (Table 3). Items that proved more difficult to code included those related to benefits and penalties, as well as specific characteristics of the keg tag.

Because penalty provisions are a key component of these laws, we developed additional penalty provision items after the first round of coding, and two coders (an attorney and law student) independently reread all states' penalty provisions. We jointly resolved any remaining coding differences in discussions with an alcohol policy scientist who brought health policy perspectives to the legal interpretation of these laws and assisted in final consensus decisions on coding.

Table 2
Additional data sources beyond statutes and regulations

States with keg laws	Agency survey	Standardized registration form	Standardized
Keg tag			
CA	X	X	X
CT	X	X	X
GA	X	X	X
ID	X	X	X
IN	NA ^a	NA ^a	NA ^a
KS	X	X	X
ME	X	Standardized but no sample received	
MD	X	X	X
MN	X	Not standardized	Not standardized
NE	X	X	X
NH	X	X	X
NM	X	X	Not standardized
ND	NA ^b	Not standardized ^b	Not standardized ^b
OR	X	X	X
SD	X	Not standardized	Not standardized
VT	X	X	Not standardized
VA	Non-response ^c	X	X
WA	X	X	X
Totals	15	13	11

DC, MA and RI did not respond to the survey or follow-up requests for information and are excluded.

^a IN keg law was effective 7/1/2003; no additional information available at time of study beyond the enacted laws.

^b ND keg law is carried out at the local level; no standardized forms, tags, or other information was available.

^c Incomplete/partial survey responses from VA agency participant counted as non-response.

3. Results

3.1. Statutes and regulations

From our initial search of Westlaw's legal databases, we identified 20 states and the District of Columbia with enacted beer keg registration laws; the policies differ substantially from state to state. The first state to enact a keg registration policy was Oregon in 1978. In the 1980s, four additional states enacted keg laws (Idaho, New Mexico,

North Dakota and Washington). In the 1990s, an additional 10 jurisdictions enacted laws (California, Connecticut, District of Columbia, Maine, Maryland, Nebraska, South Dakota, Vermont, and Virginia), and by mid-2002, another five states had keg laws in effect (Georgia, Kansas, Minnesota, New Hampshire and Rhode Island). Finally, Indiana passed a law that took effect in 2003.

We first report results for statutory and regulatory provisions reflected in written legal documents. We do not include additional information about state practices

Table 3
Reliability of beer keg registration policy measures

Conceptual component	# Items	K ^a	Policy details
Target(s)	9	0.73	Does law explicitly apply to sellers? buyers? others? whom?
Administrative	31	0.83	What are the requirements of the law forcollecting sales information? Includes: content requested on form or receipt; form/receipt format; Identified keeper of form/receipt; required length of time form/receipt retained; regulations on access to forms/receipts by law enforcement; statewide data collection system requirements
	19	0.73	...affixing identification tags or labels to beer kegs/containers? includes: tag/label format; tag/label contents; cost and who carries the burden of cost; instructions for tag/label removal
	6	0.98	...collecting beer keg deposits? Includes: mandatory or voluntary deposit collection; required dollar amount; instructions regarding deposit forfeiture
Enforcement	3	0.92	How is the law enforced? following complaints or incidents (passive); random checks for compliance (active)?
Penalties	9	0.71	What penalties apply for violations of the law by sellers? by buyers? by those in possession?
Education	7	0.92	How does the law provide for notifying/educating the seller regarding the keg law? the buyer? law enforcement agents?
Benefits	3	0.70	How does the law benefit the seller? the buyer?
Miscellaneous	4	1.0	What other provisions are specific to this law but not noted elsewhere? Includes: keg size; preemption provisions; formal evaluation of effectiveness of law?

^a Kappa reliability score is the average score for the items included in the component or sub-component. Three coders independently coded each component; scores were calculated on pairs of coders for each item.

obtained through interviews and examination of keg tags and registration forms here.

3.1.1. Target(s) of the law

All 21 laws on keg registration clearly required action from sellers of beer kegs, and, with the exception of North and South Dakota, all states clearly targeted purchasers of beer kegs. For our purposes, the law had to explicitly specify that a targeted population must take action and/or refrain from taking action. Legal wording clearly identifying targets of the law typically took the form of this example from Connecticut:

Any holder of a package store permit or a grocery store beer permit under section 30–20 that sells kegs for consumption off the permit premises shall, at the time of sale, (1) place an identification tag on all kegs sold by the permittee, (2) require each purchaser of any such keg to sign a receipt for the keg, and (3) inform such purchaser that any deposit paid by the purchaser for the keg, if required, shall be forfeited if the keg is returned without the original identification tag intact and readable (Conn. Gen. Stat. Ann. § 30–114).

Beyond the seller and the buyer, determining whether the law specifically targeted other population groups was more difficult. In some cases, we could clearly infer the law's other target(s) but they were not explicitly written. Yet, numerous laws enumerate specific other relevant targets, such as possessors of the keg (13 states), adult providers of alcohol to underage youth (8 states), persons removing or defacing the tag (8 states), youth under the legal drinking or purchase age (4 states), and beer distributors (2 states).

3.1.2. Administrative requirements—registration forms/receipts

A key element of all keg registration policies is the collection by the seller (retailer or wholesaler) of information that allows law enforcement agents to trace a beer keg back to the purchaser through the registration form or receipt. While all 21 states with keg registration laws specify in writing that information must be collected, our findings show wide variation in what is explicitly required on such forms at the time of sale. All states, except Minnesota and Indiana, require the purchaser's name and address, two seemingly obvious items. Sixteen states require the purchaser's signature. The date of sale (10 states) and keg registration number (11 states) are required by law on the form or receipt in approximately half of the states. Several other items are explicitly required by law in a few states, such as purchaser's date of birth (5 states), intended use of the keg (4 states), information regarding various penalties for careless or illegal uses (4 states), or signatures acknowledging understanding of penalties or pledging proper use (7 states). In Vermont, the law is explicit on some things and less so on others as shown in this excerpt:

The purchaser shall complete a form, provided by the board, which includes at least the name, address and date of birth of the purchaser as they appear on the purchaser's proper proof of identification and the identification number of the keg. The form shall also include the provisions of this section and the penalties for violation of these provisions. The licensee shall retain the form for 90 days after return of the keg (Vt. Stat. Ann. tit. 7, § 64).

In all states except Indiana, the law explicitly asserts that the seller must retain the completed registration form, and 19 states specify a length of time the forms must be retained (from 1 to 36 months). Fourteen states legislate that establishments must make keg registration information available to law enforcement agents.

3.1.3. Administrative requirements—keg identification tags or labels

The keg identification tag is an essential element of a workable keg registration policy. Some form of keg identification tag, label or seal must be affixed to the keg to link the container to the registered purchaser and/or seller. While all 21 states specify that the purchased keg will have affixed to it a tag of some form to be determined outside of the law (but approved by a specified state agency), only 17 states explicitly legislate that the tag must display an identifying number. Other requirements for the keg tag varied across the states, including: information identifying the seller (13 states), information identifying the purchaser (4 states), the name of the clerk who sold the keg (1 state) and clear warnings to the purchaser about the consequences for careless and illegal use of the tag and/or the keg (2 states). Virginia's law is a good example of a regulation that explicitly states what should be done with the identification tags.

No person licensed to sell wine or beer at retail for off-premises consumption, or any officer, agent or employee thereof, shall sell any such alcoholic beverage in a keg without having ... (iii) affixed a registration seal on the keg at the time of sale; provided, if the purchaser takes possession of the keg at the premises of the wholesale licensee pursuant to subsection G, the wholesale licensee shall affix the registration seal (3 Va. Admin. Code 5-70-180).

3.1.4. Administrative requirements—keg deposits

Only four states require a deposit or fee for the purchase of a beer keg (from as little as \$1 to as much as \$50 per keg). Three states provide for forfeited deposits in such a way that allows the retailer to keep all or part of the money, with or without some restrictions on its use (depending on the state).

3.1.5. Enforcement

No state laws or regulations had specific provisions regarding passive (e.g. responding to complaints) or active (e.g. random checks of retailers) enforcement of keg laws.

Instead, enforcement provisions were often contained in other statutory provisions regarding the general duty of law enforcement personnel to enforce all provisions of liquor laws.

3.1.6. Violations and penalties

Penalty provisions were often not fully specified in keg registration laws. Such provisions are typically located in a state's criminal code or general administrative provisions regarding retailer responsibilities. For the current study, we examined provisions contained in the actual keg registration law itself or in specific laws/regulations referred to in that statute; we did not review states' statutory provisions for penalties more generally.

Four state laws on keg registration had no direct provisions for penalties. Fourteen states explicitly named violations associated with the seller of beer kegs (e.g. failure to require signing of the receipt; failure to place a tag on the keg; making false entry in records; failing to keep records for inspection). Associated penalties for these seller violations included disciplinary action, establishment license suspension or revocation, gross misdemeanor, and fines. California law contains a typical example of the more vague references to penalties:

Any licensee selling keg beer for off premise consumption who fails to require the signing of a receipt at the time of sale and fails to place a numbered identification label on the keg shall be subject to disciplinary action pursuant to this division (Cal. Bus. and Prof. Code § 25659.5).

3.1.7. Education

By and large, state laws made little or no explicit provision for education regarding keg registration. For instance, no states provided for educational or training programs for sellers or for law enforcement agents. However, 10 states required that the keg purchaser be informed (either in a written or verbal form) of at least some penalties for failing to comply with the law.

3.1.8. Benefits

Benefit provisions were rare and, as reliability scores indicate (Table 3), coders found determining benefits to be difficult because laws rarely use this language. Instead, benefits are inferred. For instance, the benefit stated for a seller in four state laws was the ability to retain the keg deposit or fee if the keg was returned with a missing or defaced tag, as shown in this example from Massachusetts's keg law:

'Non-refunded container fees paid pursuant to 204 CMR 9.00 shall belong to the licensee' (Mass. Regs. Code tit. 9, § 9.06).

Five states specifically mentioned benefits, stating that if establishments comply with provisions of the law, sellers can use such compliance as a defense in any charges brought

against them pursuant to the keg law. No other state laws specifically stated any benefits to the seller for complying with the law. Four state laws inferred a benefit (refund of the deposit or fee upon proper return of the keg) to purchasers of kegs.

3.1.9. Other key provisions

We observed two additional notable provisions. First, 19 states included specifications on the actual size of a keg (ranging from 2 to 16 gallons). Second, three states' laws included indications of preempting local control; that is, legal limits on the authority of local governments to regulate kegs. The statutes indicate that local ordinances or resolutions that conflict with the state's beer keg law are null and void.

3.2. Forms/tags and agency surveys

Current laws covering keg registration generally do not specify physical characteristics of the registration form or receipt. For the most part, the registration forms we collected from state agencies were printed either on conventional 8 1/2 × 11-in. or smaller paper, a copy of which also served as the keg tag. No state legislated tag or label size and color; observed tags were typically white or bright yellow and small (e.g. 1 × 3 in.).

States legislated what content needs to be included on registration forms and keg tags, and we compared statutory requirements with actual form and tag samples (Table 4). Many states include a number of helpful items on forms and tags, even though they are not specifically legislated, indicating that specific implementation procedures and technological improvements regarding policies are likely to change over time.

We supplemented analyses of legal language and sample forms and tags with surveys of state liquor control agency informants. Survey respondents generally indicated they had no direction about where to attach tags or labels to beer kegs, and that tags and labels often inadvertently fell off the kegs, especially in inclement weather. Policy-makers and control agencies clearly struggle with decisions about non-removable label materials and adhesive characteristics, since the laws prohibit the removal of tags by customers.

Although few statutes specifically addressed issues of enforcement and penalties, most informants report that their agencies include checks of keg registration compliance at the same time they conduct routine checks for compliance with other liquor laws. Additionally, as we learned from legal searches, interviews indicated that penalties for violating keg registration laws were often covered under administrative or criminal code provisions. Several key informants indicated that, despite the availability of criminal penalties, their courts are notoriously lenient on violators of keg registration laws.

Agency officials also provided information on how relevant populations were to learn of the keg registration

Table 4
Comparison of legal requirements for forms and tags with actual sample evidence

Registration form content (13 states)	Number of states with content in/on	
	Statutes and regulations	Sample evidence
Buyer name	13	13
Buyer address	13	13
Buyer date of birth	4	13
Keg registration number	7	13
Buyer ID number	10	13
Date of sale	6	11
Inform not to serve to minors	6	11
Inform buyer >21	3	9
Inform not to remove/deface tag	2	11
Buyer signature	11	13
Penalties for serving minors	2	4
Penalties for removing/defacing tag	1	4
Penalties for not returning keg	1	1
Keg deposit or fee stated	1	2
Keg size stated	1	5
Date keg returned	2	4
Tag removed stated	2	0
Keg tag content (11 states)		
Keg identification number	10	11
Name of clerk/seller selling keg	1	3
Warning re: removing/defacing tag	0	6
Warning re: serving to minors	1	5
Buyer identification information	3	6
Removable	9	11
Reusable	0	0
Size	0	Varies by state

requirements. Several states include discussion of keg registration in responsible alcoholic beverage server training programs for liquor licensees and provide brief information to law enforcement officers as part of general training on state liquor laws. Several respondents indicated purchasers were made aware of the law by virtue of the information contained in the registration form, for which they were required to verify by signature that they read and understood. Others respondents suggested that the seller verbally informs the buyer of the requirements of the law, although none reported the extent to which that actually occurs.

Most respondents indicated that the law did not provide particular benefits to either seller or purchaser in complying with the keg laws. Several suggested that the ability to keep the keg deposit if the keg was returned without a tag or with a defaced tag was a possible benefit to the seller, and correspondingly a benefit to the buyer if the deposit were returned to them at the time they returned an intact keg. A few respondents suggested that a practical benefit to the seller might be a reduction in potential liability or prosecution if they comply with keg laws. One respondent indicated a possible benefit to the seller would be a reduction in keg sales (a bulky and

inconvenient sales method at the lowest cost per drink), with a corresponding increase in beer sales in cans or bottles.

We asked participating agency respondents to indicate ways the state evaluated the effectiveness of its keg registration law in reducing underage drinking or harm associated with drinking from beer kegs. Most indicated that they had no information regarding the effectiveness of their keg laws, and that they did not know of any attempts to measure effectiveness. Also, one agency informant indicated that the agency did not have the knowledge needed to measure policy effectiveness, even though the state was developing a database of information regarding case dispositions and prosecutions. In another state, the liquor commission is required to issue an annual report on keg violations and convictions to the legislature pursuant to statute. Interestingly, their report also indicates whether the commission recommends continuing, eliminating or making changes to the beer keg law. When asked for personal opinions regarding keg policy effectiveness, some respondents reported that fewer stores are selling kegs after the law took effect, and that keg sales are decreasing.

4. Lessons learned

A key lesson for evaluators working on any state-level policy issue is the complexity and difficulty of accurately determining: (1) whether each state has a specific policy in force, (2) the effective date of the policy, and (3) whether a state's law includes specific provisions relevant to a broader health or social welfare objective. For example, a simple data element such as date quickly becomes complicated. We used a specific data collection reference date for all data reported here. Thus, we conducted all searches of Westlaw data at a specific point in time and included results from a consistent, defined search strategy. However, there is uncontrolled variability in how quickly each state's statutes and administrative codes are updated in Westlaw. Therefore, it is possible that very recent legal changes are not included due to such data processing delays, and our results cannot absolutely guarantee inclusion of all laws effective on 10 September 2002.

Beyond complexities of precise data elements such as date, the broader lesson is how difficult it is to identify and correctly code state laws for policy evaluations. The effort required to collect the data reported here included several person-months by an attorney already familiar with the policy topic, here alcohol policy. Many policy evaluators take at face value the presence or absence of a state law as reported by various interest groups, government agencies, or others. Such lists are known to include a substantial amount of error, which can significantly reduce the validity evaluation studies (Lafond, Toomey, Rothstein, Manning, & Wagenaar, 2000).

5. Discussion

Keg registration laws in the US are considerably diverse in statutory and regulatory provisions, as well as in implementation forms and procedures. The laws vary on seven core conceptual domains, as well as on many smaller procedural issues. Clearly, representing keg registration policies as dichotomous variables (i.e. policy vs. no policy) in evaluation studies is not adequate. Keg registration laws are a good example of the broader issue facing policy evaluators, that most policies are continua, not dichotomies. Efforts to develop the relevant conceptual categories, measurement models, and coding schema for each public policy domain are warranted. We show here that collecting original source data on public policies, coding with multiple raters and obtaining measures of policy dimensions at acceptably high levels of reliability is possible, as has been found for select tobacco control laws (Alciati et al., 1998; Chriqui et al., 2002).

The need for more research remains. First, we need a system of weights or values for the conceptual components of keg registration laws to help identify which state's laws are closer to a deemed 'best practice.' Such a system would help address which laws have a higher proportion of components that are logically related to policy objectives and, thus, which laws are likely to be effective in reducing alcohol availability to youth from beer kegs. In short, researchers could then array states on a metric scale of policy 'quality'. Moreover, there might not be one single dimension of 'quality' but quality in many policy cases may well be multi-dimensional. Studies evaluating the effects of policies relevant to health and social outcomes can then incorporate such quality measures. Very weak or poorly designed and implemented policies would not be expected to affect more-distal health or social outcomes. Because poor laws could mask the effectiveness of a small number of good laws, studies examining numerous poorly designed laws aggregated with a few well-designed laws are unlikely to discern effects.

To date, we are not aware of any published 'best practices' guidelines for keg registration laws. Clearly, high quality laws must address components found correlated with effective laws in other areas: (1) clear and straightforward procedures to facilitate implementation, (2) penalties substantial enough to meet the necessary threshold of deterrence, and (3) enforcement and education publicity components sufficient to achieve knowledge on how to comply and a high perceived probability of violation detection (Ross, 1984).

In addition to using continuous measures of policy conceptual quality, evaluation studies should include multiple outcome measures. For example, to examine effects of keg registration laws, outcomes may include rates of keg sales, bottled beer sales, beer consumption, intoxication among teens, rates of teen parties, or frequency of disturbance calls to police, as well as more direct measures of teen consumption of keg beer.

Many state alcohol control agency respondents noted very low levels of enforcement of extant keg registration laws and high levels of leniency in imposing penalties. Even a well-constructed law is not likely to show effects if the public is not aware of the law, and it is poorly implemented and rarely enforced. Although obtaining implementation information may be difficult in large, multi-state studies, additional efforts to incorporate the central mediating effects of implementation in policy evaluation statistical models is warranted.

Finally, we clearly need small, basic studies and field-testing of the 'nuts and bolts' of keg registration policies. Almost half the states in the US now have keg registration policies in place, but our analyses of forms and tags and results from interviews of state agency staff reveal an almost complete lack of information on optimal, tamper-resistant label designs, the types of adhesives to use, the practicalities of embossing permanent serial numbers on kegs, effective registration form designs, specific information to collect on registration forms, and methods to store, process, and retain forms. Opportunities to streamline and improve the registration process may include electronically scanning a code on the keg, as well as the driver's license of the purchaser, which could eliminate paper forms entirely.

Keg registration policies address a relatively small portion of youth access to alcohol and related problems. Nevertheless, if states develop efficient keg registration policies and procedures, teen drinking at keg parties may be significantly reduced and important public health benefits achieved. The issues and complexities associated with implementation and evaluation of an apparently simple policy such as keg registration illustrate what is needed in any policy domain—a conceptual design of policy components intended to address particular needs, reliable coding and development of continuous measures of policy 'quantity' and 'quality,' research and field testing of optimal implementation procedures, evaluation of effects of 'best practice' policy, and finally, studies of effects as the policy diffuses more broadly across the nation.

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References

- Alciati, M. H., Frosh, M., Green, S. B., Brownson, R. C., Fisher, P. H., Hobart, R., et al. (1998). State laws on youth access to tobacco in the United States: Measuring their extensiveness with a new rating system. *Tobacco Control*, 7, 345–352.

- Chriqui, J. F., Frosh, M., Brownson, R. C., Shelton, D. M., Sciandra, R. C., Hobart, R., et al. (2002). Application of a rating system to state clean indoor air laws (USA). *Tobacco Control*, 11(1), 26–34.
- Hammond, R. L. (1991). Capping keggers. *The Bottom Line on Alcohol in Society*, 11(4), 36–38.
- Hingson, R., Heeren, T., Levenson, S., Jamanka, A., & Voas, R. (2002). Age of drinking onset, driving after drinking, and involvement in alcohol related motor-vehicle crashes. *Accident Analysis and Prevention*, 34, 85–92.
- Jones, A. (2002). Woman pleads guilty in drunken girl's death. *Atlanta Journal and Constitution*, H1 (July 27).
- Lafond, C. L., Toomey, T. L., Rothstein, C., Manning, W., & Wagenaar, A. C. (2000). Policy evaluation research: Measuring the independent variables. *Evaluation Review*, 24(1), 92–101.
- Monti, P. M., Miranda, R., Nixon, K., Sher, K. J., Swartzwelder, S., Tapert, S. F., et al. (2005). Adolescence: Booze, Brains, and Behavior. *Alcoholism: Clinical and Experimental Research*, 29(2), 207–220.
- Nachbar, J. (2001). 2001 session a tough on for alcohol policy advocates. *The messenger: A newsletter of MN join together coalition to reduce underage drinking*. Mounds View, MN: Minnesota Institute of Public Health.
- National Center for Injury Control and Prevention (2001). *Injury fact book 2001–2002*. Atlanta, GA: Centers for Disease Control and Prevention.
- Ross, H. L. (1984). *Deterring the drinking driver: Legal policy and social control*. Lexington, MA: Lexington Books.
- Smith, G. S., Branas, C. C., & Miller, T. R. (1999). Fatal nontraffic injuries involving alcohol: A meta-analysis. *Annals of Emergency Medicine*, 33(6), 659–668.
- Wagenaar, A. C., Finnegan, J. R., Wolfson, M., Anstine, P. S., Williams, C. L., & Perry, C. L. (1993). Where and how adolescents obtain alcoholic beverages. *Public Health Reports*, 108(4), 459–464.
- Wagenaar, A. C., & Toomey, T. L. (2000). Alcohol policy: Gaps between legislative actions and current research. *Contemporary Drug Problems*, 27, 681–733.
- Wagenaar, A. C., & Toomey, T. L. (2002). Effects of minimum drinking age laws: Review and analyses of the literature. *Journal of Studies on Alcohol Suppl.* 14, 205–225.