Research Protocol for State Occupational Safety and Health Standards

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State Occupational Safety and Health Standards

I. Date of Protocol: March 12, 2015

II. Scope: Create cross-sectional datasets of all state-specific regulations and laws (hereafter referred to collectively as “standards”, although the vast majority of standards were regulations, not statutes) protecting workers from occupational safety and health hazards in effect in the 25 states with their own occupational safety and health enforcement agencies (known as “state OSHA plans” or simply “state plans”). We defined “state-specific” standards as those not adopted identically (“by reference”) from the federal Occupational Safety and Health Administration (OSHA) and that are enforced by one of the 25 state OSHA plans. The coding questions in these datasets are based largely on the classification scheme for the regulations under the jurisdiction of federal OSHA. The coding questions ascertain the presence or absence of a state-specific safety or health standard and, in some cases, delineate the specific provisions thereof. The datasets were limited to state-specific standards that addressed one or more specific occupational hazards and do not include so-called “administrative” (e.g. recordkeeping and reporting) standards.

III. Datasets: Six different datasets were created, corresponding to six different industrial categories (four corresponding to federal OSHA categories and two with no federal analog), as follows:

a. General Industry. This broad category includes coding questions, and standards, which generally apply to all workplaces and employers, except when superseded by another, industry-specific standard in one of the other five industrial categories, or as indicated otherwise in the standard’s scope or applicability provisions. The coding questions for the General Industry dataset were derived primarily from the classification scheme adopted by federal OSHA in 29 CFR 1910.

b. Construction. Coding questions for this category were developed to address standards applying only to the construction industry, as defined by each state. The coding questions for the Construction dataset were derived primarily from the classification scheme adopted by federal OSHA in 29 CFR 1926.

c. Agriculture. Coding questions for this category were developed to address standards applying only to the agricultural industry, as defined by each state. A few of the coding questions for the Agriculture dataset were derived from the federal OSHA regulations at 29 CFR 1928, but most of the coding questions were created to accommodate state-specific standards for agricultural employers that had no federal analog in 29 CFR 1928.
d. **Maritime.** This is the fourth federal OSHA industrial category, encompassing federal regulatory chapters 29 CFR 1915, 1916, 1917, and 1919. Because only two states (CA and WA) had state-specific standards for this industrial category, only a single coding question was created for this dataset. The question simply ascertained whether or not a state had issued any standards applying only to the Maritime sector.

e. **Oil and Gas.** This category has no federal analog, as federal OSHA has not promulgated regulations targeted specifically at the oil and gas industries. Several states have created regulations applying only to employers in the oil and gas industry, but due to the lack of a federal analog, the number and diversity of regulations across the different states, and the somewhat specialized knowledge required to interpret many of the industry-specific regulations, only a single coding question was created for this dataset. The question simply ascertained whether or not a state had issued any standards applying only to the Oil and Gas sector.

f. **Mining.** This category also has no federal analog and was created to accommodate the only state plan, CA, which has created standards enforcing occupational safety and health in the mining industry. In all other states with a state OSHA plan, and at the federal level, mining safety and health is enforced by other regulatory agencies (e.g. the federal Mining Safety and Health Agency, or MSHA). As with the Maritime and Oil and Gas categories, the Mining dataset had only one coding question ascertaining whether or not the state had issued any standards applying only to the Mining industry.

IV. **Primary Data Collection:**

a. **Project Dates:** January 7, 2014 – February 25, 2015

b. **Dates Covered in the Dataset:** October 20, 2014 – February 2, 2015

c. **Data Collection Methods:** The primary research team included two primary researchers (“Researcher #1” and “Researcher #2” or “Researchers”) and one supervisor (“Principal Investigator” or “PI”).

   i. With the help of state plan administrators, researchers identified all sections of the administrative code under the jurisdiction of the 25 state OSHA plans, using the **Databases** described below. Once these sections of the administrative code were identified, all data was redundantly collected, with Researchers #1 and 2 blinded to each other, in the following manner. First, researchers #1 and 2 distinguished state-specific standards from those adopted identically from a federal regulation under the jurisdiction of federal OSHA. They then compiled all state-specific standards into a database for each of the 25 states in the dataset. The researchers’ lists of state-specific standards were then compared with one another, with any discrepancies resolved by consensus among the two researchers.

   ii. Because the datasets included a large number of different standards for each state, the “Effective Date” for each state did not correspond to the
effective date of each of the individual standards, but rather to the date on which the state OSHA plan received “Initial Approval” from federal OSHA, which, according to federal OSHA administrators, represented the date on which the state plan was authorized to commence rulemaking and enforcement activities. The “Initial Approval” dates were available online on the following federal OSHA website: https://www.osha.gov/dcsp/osp/approved_state_plans.html.

d. Databases Used: All standards were compiled using WestLaw Next, with four exceptions, CT, MI, SC, and VT, for which all state-specific standards were compiled using each state OSHA plan’s website. The state plan websites contained a comprehensive and updated list of all state-specific standards, per state plan administrators. These four state websites were used in lieu of the states’ administrative codes for the following reasons:

i. Michigan. The way in which its regulations were organized within the state’s administrative code was unwieldy, as the regulations were dispersed over numerous different regulatory chapters.

ii. South Carolina. Researchers were informed by state plan administrators that the state’s administrative code was not up to date.

iii. Vermont and Connecticut. The single state-specific standard in each of these two states was actually a federal rule, adopted by reference, preserving a set of chemical exposure limits promulgated in 1989 (see 1989 Federal Permissible Exposure Limits [PELs] for Chemical Toxins). Because this was a federal rule, it was not clearly distinguished from other federal rules adopted by reference in the states’ administrative codes and therefore had to be ascertained from the states’ websites.

iv. The websites of the four state plans mentioned above, used for data collection, are as follows:


In addition, the website of another state program, OR (http://www.orosha.org/rules_laws.html), was used to help match certain regulations downloaded from WestLaw Next to the relevant federal OSHA Subparts and, thereby, to the most appropriate coding questions in our datasets.

e. Initial Returns and Additional Inclusion or Exclusion Criteria

i. Following initial data collection, only state-specific standards, under the sole or shared jurisdiction of one of the 25 state OSHA agencies, were included in the dataset. State-specific standards were defined as all those not adopted by reference from, and therefore identical to, a federal regulation under 29 CFR 1910 (federal General Industry standards), 29 CFR 1926 (federal Construction standards), 29 CFR 1928 (federal
Agriculture standards), or 29 CFR 1915, 1916, 1917, and 1919 (federal Maritime standards). There were two exceptions to this rule:

1. **1989 Federal Permissible Exposure Limits [PELs] for Chemical Toxins.** In 1989, federal OSHA promulgated new chemical PELs for hundreds of chemical toxins, all but one representing more protective exposure limits for workers than existed at the time. In response to litigation filed over the manner of the rulemaking process, federal OSHA was forced to rescind all of these new PELs (commonly known as the “1989 PELs”) and, in 1993, reverted to the pre-1989 values. However, several state OSHA plans opted to retain the more protective 1989 PELs. In these states, the 1989 PELs were considered “state-specific standards”, even though they had originally been adopted by reference from a (since-rescinded) federal OSHA rule.

2. **Extending the applicability of an adopted federal standard to more employers, within the same or another industrial category.** Some states adopted a federal standard by reference, but explicitly extended the scope of the standard to a greater number of workers than may otherwise have been covered by the federal standard. This could entail expanding the standard’s coverage to employers in other industrial categories (e.g. from Construction to General Industry) or to a more employers within the same industrial category (e.g. Agriculture). For example, two states, KY and MI, extended the scope of certain federal Construction (29 CFR 1926) standards to all (i.e. General Industry) employers in the state. Another state, NC, extended the scope of the federal Agricultural (29 CFR 1928) Field Sanitation standard to all agricultural employers, regardless of size, whereas the federal standard was restricted to agricultural employers with 11 or more employees.

ii. State-specific standards not adopted by reference from a federal regulation under 29 CFR 1910, 1926, or 1928 were excluded from the dataset if they:

1. were not under the jurisdiction of one of the 25 state OSHA plans;
2. were considered by the researchers to be generic “administrative” standards, defined as those not addressing specific occupational safety or health hazards, and not targeted at specific industries, worksites, or work processes. Examples of administrative standards were those outlining recordkeeping, reporting, or citation appeal processes. There were two exceptions to this rule:
   a. Administrative-type rules applying to a specific hazard or hazards were included in the database, an example being AK’s Asbestos Abatement Certification (8 AAC 61.600-790) and Painting Certification (8 AAC 61.800-890) standards.
b. Hazard Communication Standards. Any state-specific standard requiring employers to inform employees of potential or actual hazards were included in the dataset. This is because, unlike, say, recordkeeping and reporting, hazard communication is addressed within a set of hazard-specific standards within the main body of federal General Industry (29 CFR 1910.1200) and Construction (29 CFR 1926.59) rules;

3. or, in the case of MI, were listed as “identical” to a corresponding federal standard under 29 CFR 1910, 1926, or 1928.

V. Coding

a. Development of Coding Scheme

i. Coding questions were created for all six datasets included in this mapping study. However, for three of these six datasets (Maritime, Oil and Gas, and Mining), only a single coding question was created, simply ascertaining whether or not a state had issued any standards applying only to workers in those industries. Therefore, the rest of this section, detailing the development of the coding questions, applies only to the other three industrial datasets (General Industry, Construction, and Agriculture).

ii. For the General Industry, Construction, and Agriculture datasets, the coding scheme was based primarily on the classification of federal OSHA’s regulations in 29 CFR 1910 (General Industry), 1926 (Construction), and 1928 (Agriculture). The federal regulations in these chapters are organized by occupational safety or health hazard (e.g. Fall Protection) or, in a few cases, by specific industry (e.g. Telecommunications) or work process (e.g. Spray Finishing operations). The federal regulatory classification was chosen because it is the most universally recognized classification scheme for occupational safety and health standards and because all of the state OSHA plans, except CA and WA, adopted the federal organizational framework for most of their own regulations. However, a large number of states also developed additional standards (e.g. on Heat Stress) not classifiable under the federal structure because they addressed hazards unaddressed in the federal code. A number of additional coding questions were created to accommodate these supplemental state-specific standards. This was especially true for the Agriculture dataset, with the result that most of the coding questions in this dataset have no analog in federal OSHA’s Agriculture regulations at 29 CFR 1928.

1. Parent questions. The parent questions were created primarily based on the broad categories of regulations, known as Subparts, in federal OSHA’s classification scheme: a) A-Z for 29 CFR 1910 General Industry, b) A to CC for 29 CFR 1926 Construction, and c) A to M for 29 CFR 1928 Agriculture. As stated above, there were numerous state-specific standards that did not fit neatly into any Subpart. In some cases, rewording the parent question to
expand the scope of the federal Subpart title was sufficient to accommodate the state-specific standard. In other cases, however, new parent questions, with no derivation from any federal OSHA Subpart, had to be created, especially for the Agriculture dataset, to account for state-specific standards addressing hazards, industries, or work processes entirely unaddressed in any federal Subpart. In still other cases, the federal OSHA Subpart was too vague and broad to be useful to users, so the individual regulations under the Subpart were made separate parent questions, rather than child questions as was usually the case (see below for more on Child Questions).

2. Child questions. Child questions were created for some, but not all, of the parent questions. Child questions corresponded roughly to the individual federal OSHA regulations under each Subpart in 29 CFR 1910, 1926, and 1928, although additional questions were required to account for state-specific regulations with no federal counterpart. The decision to create child questions was based primarily on whether each of the individual regulations within each federal OSHA Subpart (or each state-specific broad category of standards) were sufficiently different in scope and requirements to necessitate separate coding with child questions.

3. Grandchild questions. Grandchild questions were created for only a few child questions. The decision to create a grandchild question was based on the researchers' determination that the details of the standards were sufficiently important to necessitate questions that allowed users to compare these details across the different states with such standards. For the most part, these grand-child questions had no federal counterpart and were based primarily on the researchers' interpretations of the individual provisions of each federal OSHA or state-specific regulation.

iii. Researcher #1 entered the coding questions into the dataset. The questions were modified, deleted, and supplemented as necessary following the Redundant Coding and Naive Coding processes.

b. Coding Methods. Researcher #1 coded all 25 states using the coding methodology identified above. Researcher #2 coded 7 of the 25 states in a blinded fashion, as indicated in Quality Control below.

i. Classification to industrial categories. State standards were first classified to one of the six broad industrial categories: a) General Industry, b) Construction, c) Agriculture, d) Maritime, e) Oil and Gas, or f) Mining. All 25 state plans generally specified to which of these six industrial categories each particular standard, or group of standards, applied. The researchers confirmed their final classification of standards, by industrial category, with state OSHA administrators, including the classification of the minority of standards in which the applicable industrial category was
not made explicit. In a few cases, a standard was classified to more than one industrial category based either on the scope of the standard or feedback from state OSHA administrators.

### ii. Classification to coding questions (General Industry, Construction, and Agriculture rules only)

All state-specific standards were classified primarily according to their title and scope, outlining the hazards, industries, and/or work processes to which the standard applied. All state standards, or group of standards, were classified to a maximum of one parent, one child, and one grandchild question (i.e. vertical classification only). If a standard addressed hazards, industries, or work processes covered in more than one parent, child, or grand-child question, the standard was broken up and each of its individual provisions were coded to the question to which they applied. No citation was duplicated across more than one parent question, or more than one child/grandchild question within the same parent question (i.e. no horizontal duplication).

We developed a coding hierarchy, which set out sequential criteria according to which we attempted to classify a standard to a particular coding question.

1. **Federal OSHA counterpart in 29 CFR 1910, 1926, or 1928.** The federal General Industry (1910), Construction (1926), and 1928 (Agriculture) regulations constituted the principal criterion by which we classified state-specific standards. There were two groups of state standards classified according to this criterion:
   a. State standards that amended or supplemented a specific federal regulation and clearly cited the federal regulation within the standard text; and
   b. Standards that did not explicitly cite a federal regulation, but where the researchers identified one or more federal regulations that they deemed highly similar in intent and content to the state standard.

In both cases, researchers classified the state standard to the coding question that corresponded to the federal OSHA Subpart or regulation on which the question was based. For example, if a state Construction standard outlining rules to protect workers from falling was highly similar to a rule under the federal Personal Protective and Lifesaving Equipment (29 CFR 1926 Subpart E) rules, we would classify the standard to the coding question corresponding to that federal Subpart (Does the state have a regulation addressing Personal Protective and Lifesaving Equipment?) and not to the question corresponding to the federal Fall Protection (29 CFR 1926 Subpart M) rules.

2. **Industry, worksite, work process, or defined group of workers.** If there was no decipherable federal counterpart for the state standard, we classified the standard based on whether it applied only to a certain industry, worksite, work process, or other, defined group of workers. (Note that “industry” refers here to a smaller, more narrowly defined classification, within one of the
six, broader “industrial categories” that formed the basis of each dataset.) If it did, we classified it to the coding question corresponding to that industry, worksite, work process, or group of workers, regardless of the hazard(s) addressed in the standard. For example, a standard requiring personal protective equipment, but only for telecommunications workers, would be classified to the question “Special Industries and Worksites: Telecommunications” rather than to a question on personal protective equipment.

3. Hazard or required hazard mitigation. If: a) there was no federal counterpart for the standard, and b) the standard was not restricted only to certain industries, worksites, work processes, or other, defined groups of workers; then the standard was classified based on the hazard or hazard mitigation requirement it addressed, as reflected in the titles of the relevant coding questions in the dataset (Heat Stress, Personal Protective Equipment, etc.). Therefore, all coding questions that do not refer to a specific industry, worksite, work process, or other, defined group of workers, can be assumed to apply to all workers falling within the dataset’s industrial category, unless indicated otherwise in the standard itself.

c. Quality Control

i. Redundant Coding. Researcher #2 redundantly coded all General Industry, Construction, and Agriculture standards in 5 of the 25 states in the dataset: AZ, NJ, NY, NC, and TN, in addition to one-fourth of all General Industry, Construction, and Agriculture standards in CA and WA. (CA, WA, IL, and IN were not included in the pool of states selected for naïve coding; see Naïve Coding below.) Researcher #2’s coding results were then compared with those from researcher #1 and discrepancy rates were calculated as follows:

1. Discrepancy rate, using all coded answers (“yes” and “no” answers) as denominator (5 of 7 states). This is the standard method for calculating discrepancy rates in LawAtlas and was the method used for the naïve coding discrepancy rate below. This calculation was possible only with the five states (excluding CA and WA) for which all standards were redundantly coded and, therefore, all coding questions were answered in LawAtlas. The rate of discrepancy for these five states was 3.3%.

2. Discrepancy rate, using only coded standards (“yes” answers) as denominator (all 7 states). In order to account for CA and WA, which were not included in the standard method above, we calculated a discrepancy rate using the total number of coded standards, rather than the total number of coding questions answered. Using this method, researchers #1 and #2 differed on
90 out of a total of 302 different standards redundantly coded, for a discrepancy rate of 29.8% across all seven states.

Discrepancies between researchers #1 and #2 were resolved by consensus among the two researchers and the principal investigator, or, in a few cases, after further consultations with administrators of the state plans. Coding questions were subsequently changed, as appropriate, based on the discussions and consensus achieved at the resolution meeting and with the state plan consultations.

ii. Naïve Coding. Following the redundant coding process, a third coder, who had heretofore not been involved in the research in any capacity, was enlisted to code the General Industry, Construction, and Agriculture standards in 6 randomly selected states. However, four states were excluded from the pool of potential naïvely coded states, for the following reasons: a) CA and WA were excluded because they were outliers that used a different classification scheme, and in many cases different terminology, than that adopted by federal OSHA, necessitating some expertise in occupational safety and health to code their regulations and laws, and b) IL and IN were excluded because they had no, or only one atypical, state-specific standards, respectively. This resulted in a final pool of 21 states from which 6 states were randomly selected for naïve coding. The random selection of the 6 states was done by a fourth colleague (also not involved in the research), as follows:

1. The 21 states were ordered alphabetically, with each state assigned a number, beginning with 1, corresponding to its position within this alphabetical list.
2. An online number generator randomly selected 6 numbers from 1 to 21.
3. The 6 randomly generated numbers were then matched to the 6 states with the same alphabetically assigned number.
4. The 6 selected states were: AK, AZ, HI, MI, SC, and UT.

Once the naïve coding was complete, the naïve coder’s answers were compared with those of researcher #1. The total rate of divergence was 8.8%. All discrepancies between the naïve coder and researcher #1 were resolved by consensus among the naïve coder, researcher #1, and the principal investigator. Coding questions were revised a final time, as necessary, based on the discussions in this resolution meeting.