Supplemental Table 1: Examples of job titles by the level of substantive complexity and hazardous conditions.

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|  | **Census 2002 Occupation Code** | **Job Title** | **Substantive Complexity Score** |
| Highest 10 occupations | 3060 | Physicians and surgeons | 79.9 |
|  | 2110 | Judges, magistrates, and other judicial workers | 79.8 |
|  | 3010 | Dentists | 79.4 |
|  | 2100 | Lawyers | 77.5 |
|  | 1700 | Astronomers and physicists | 76.7 |
|  | 3250 | Veterinarians | 76.5 |
|  | 3120 | Podiatrists | 76.3 |
|  | 0010 | Chief executives | 76.2 |
|  | 1650 | Medical scientists | 76.2 |
|  | 1820 | Psychologists | 76.0 |
|  |  |  |  |
| About the 75th percentile |  |  |  |
|  | 5000 | First-line supervisors/managers of office and administrative support workers | 65.9 |
|  | 0730 | Other business operations specialists | 65.9 |
|  | 0220 | Construction managers | 65.9 |
|  | 1100 | Network and computer systems administrators | 65.9 |
|  | 2600 | Artists and related workers | 65.7 |
|  | 1310 | Surveyors, cartographers, and photogrammetrists | 65.6 |
|  | 3210 | Recreational therapists | 65.5 |
|  | 0150 | Purchasing managers | 65.5 |
|  | 0560 | Compliance officers, except agriculture, construction, health and safety, and transportation | 65.5 |
|  | 0930 | Tax examiners, collectors, and revenue agents | 65.3 |
|  |  |  |  |
| About median | 7120 | Electronic home entertainment equipment installers and repairers | 58.7 |
|  | 7600 | Signal and track switch repairers | 58.7 |
|  | 4300 | First-line supervisors/managers of gaming workers | 58.7 |
|  | 1560 | Surveying and mapping technicians | 58.7 |
|  | 5800 | Computer operators | 58.6 |
|  | 7220 | Heavy vehicle and mobile equipment service technicians and mechanics | 58.4 |
|  | 5600 | Production, planning, and expediting clerks | 58.3 |
|  | 4750 | Parts salespersons | 58.2 |
|  | 4830 | Travel agents | 58.1 |
|  | 7540 | Locksmiths and safe repairers | 58.1 |
|  |  |  |  |
| About the 25th percentile | 7720 | Electrical, electronics, and electromechanical assemblers | 50.1 |
|  | 4350 | Nonfarm animal caretakers | 50.0 |
|  | 9120 | Bus drivers | 49.9 |
|  | 8220 | Metalworkers and plastic workers, all other | 49.8 |
|  | 8550 | Woodworkers, all other | 49.8 |
|  | 8450 | Upholsterers | 49.8 |
|  | 8650 | Crushing, grinding, polishing, mixing, and blending workers | 49.8 |
|  | 8020 | Milling and planing machine setters, operators, and tenders, metal and plastic | 49.7 |
|  | 5900 | Office machine operators, except computer | 49.7 |
|  | 8500 | Cabinetmakers and bench carpenters | 49.7 |
|  |  |  |  |
| The lowest 10 occupations | 4130 | Dining room and cafeteria attendants and bartender helpers | 39.6 |
|  | 7810 | Butchers and other meat, poultry, and fish processing workers | 39.4 |
|  | 9640 | Packers and packagers, hand | 39.1 |
|  | 8410 | Textile knitting and weaving machine setters, operators, and tenders | 38.6 |
|  | 4420 | Ushers, lobby attendants, and ticket takers | 37.9 |
|  | 9610 | Cleaners of vehicles and equipment | 37.2 |
|  | 8310 | Pressers, textile, garment, and related materials | 37.0 |
|  | 4140 | Dishwashers | 35.9 |
|  | 4030 | Food preparation workers | 32.7 |
|  | 6040 | Graders and sorters, agricultural products | 31.6 |
|  | **Census 2002 Occupation Code** | **Job Title** | **Hazardous conditions score** |
| Highest 10 occupations | 9300 | Sailors and marine oilers | 80.9 |
|  | 7620 | Other installation, maintenance, and repair workers | 80.0 |
|  | 6530 | Structural iron and steel workers | 78.8 |
|  | 7310 | Heating, air conditioning, and refrigeration mechanics and installers | 76.9 |
|  | 6800 | Derrick, rotary drill, and service unit operators, oil, gas, and mining | 76.4 |
|  | 9500 | Conveyor operators and tenders | 76.3 |
|  | 7360 | Millwrights | 76.2 |
|  | 7220 | Heavy vehicle and mobile equipment service technicians and mechanics | 75.6 |
|  | 6360 | Glaziers | 75.5 |
|  | 9740 | Tank car, truck, and ship loaders | 75.3 |
|  |  |  |  |
| About the 75th percentile |  |  |  |
|  | 9260 | Subway, streetcar, and other rail transportation workers | 51.3 |
|  | 7110 | Electronic equipment installers and repairers, motor vehicles | 50.7 |
|  | 7940 | Rolling machine setters, operators, and tenders, metal and plastic | 50.1 |
|  | 6910 | Roof bolters, mining | 50.0 |
|  | 9340 | Bridge and lock tenders | 49.9 |
|  | 8530 | Sawing machine setters, operators, and tenders, wood | 49.6 |
|  | 4340 | Animal trainers | 48.7 |
|  | 9620 | Laborers and freight, stock, and material movers, hand | 48.6 |
|  | 7710 | Aircraft structure, surfaces, rigging, and systems assemblers | 48.6 |
|  | 6840 | Mining machine operators | 48.4 |
|  |  |  |  |
| About median | 0160 | Transportation, storage, and distribution managers | 28.6 |
|  | 9640 | Packers and packagers, hand | 28.5 |
|  | 4350 | Nonfarm animal caretakers | 28.5 |
|  | 0410 | Property, real estate, and community association managers | 28.3 |
|  | 1530 | Engineers, all other | 28.2 |
|  | 8300 | Laundry and dry-cleaning workers | 28.0 |
|  | 8410 | Textile knitting and weaving machine setters, operators, and tenders | 27.7 |
|  | 4600 | Child care workers | 27.6 |
|  | 8850 | Cementing and gluing machine operators and tenders | 27.5 |
|  | 4220 | Janitors and building cleaners | 27.3 |
|  |  |  |  |
| About the 25th percentile | 1610 | Biological scientists | 15.5 |
|  | 3030 | Dietitians and nutritionists | 15.5 |
|  | 8250 | Prepress technicians and workers | 15.5 |
|  | 3110 | Physician assistants | 15.4 |
|  | 2050 | Directors, religious activities and education | 15.1 |
|  | 2000 | Counselors | 15.1 |
|  | 5100 | Bill and account collectors | 15.0 |
|  | 3130 | Registered nurses | 14.8 |
|  | 5850 | Mail clerks and mail machine operators, except postal service | 14.8 |
|  | 4720 | Cashiers | 14.7 |
|  |  |  |  |
| The lowest 10 occupations | 1210 | Mathematicians | 4.9 |
|  | 3040 | Optometrists | 4.5 |
|  | 5340 | New accounts clerks | 4.2 |
|  | 4500 | Barbers | 4.0 |
|  | 0940 | Tax preparers | 3.9 |
|  | 0860 | Insurance underwriters | 3.8 |
|  | 1230 | Statisticians | 3.8 |
|  | 1200 | Actuaries | 2.6 |
|  | 3000 | Chiropractors | 2.3 |
|  | 0850 | Personal financial advisors | 2.2 |

Supplemental Table 2. Hazard ratios (HR) and 95% confidence intervals (CI) for the direct, indirect and total effects of racial/ethnic group membership on mortality mediated through substantive complexity.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Effect of belonging to a racial/ethnic group | Additional adjustment made in the model | | | | | | | | |
| Education | | |  | Income |  |  | Traditional risk factors |  |
| HR | (95%CI) | % mediated | HR | (95%CI) | % mediated | HR | (95%CI) | % mediated |
| **African American vs. white** |  |  |  |  |  |  |  |  |  |
| Natural direct effect | 1.29 | (1.19, 1.54) |  | 1.14 | (0.95, 1.37) |  | 1.15 | (0.95, 1.39) |  |
| Natural indirect effect | 1.04 | (1.00, 1.07) | 13.9% | 1.02 | (0.99, 1.05) | -- | 1.04 | (1.02, 1.08) | 23.8% |
| Total effect | 1.34 | (1.13, 1.59) |  | 1.17 | (0.97, 1.40) |  | 1.20 | (1.01, 1.44) |  |
|  |  |  |  |  |  |  |  |  |  |
| **Hispanic vs. white** |  |  |  |  |  |  |  |  |  |
| Natural direct effect | 0.78 | (0.58, 1.06) |  | 0.75 | (0.55, 1.03) |  | 0.70 | (0.51, 0.95) |  |
| Natural indirect effect | 1.02 | (0.98, 1.06) | -- | 1.01 | (0.94, 1.10) | -- | 1.02 | (0.98, 1.07) | -- |
| Total effect | 0.80 | (0.60, 1.07) |  | 0.76 | (0.57, 1.03) |  | 0.71 | (0.53, 0.96) |  |
|  |  |  |  |  |  |  |  |  |  |
| **Chinese vs. white** |  |  |  |  |  |  |  |  |  |
| Natural direct effect | 0.59 | (0.41, 0.86) |  | 0.48 | (0.32, 0.72) |  | 0.59 | (0.40, 0.87) |  |
| Natural indirect effect | 0.97 | (0.90, 1.05) | -- | 0.97 | (0.93, 1.03) | -- | 0.98 | (0.91, 1.06) | -- |
| Total effect | 0.58 | (0.40, 0.84) |  | 0.47 | (0.32, 0.70) |  | 0.58 | (0.39, 0.86) |  |

Notes. %mediated = proportion of the total effect mediated by substantive complexity of work. When indirect effect is not significant, %mediated is not estimated. All models were adjusted for age at baseline, sex, nativity, working status at baseline, and study sites.