

## 〈Supplementary Table〉

**Table S1.** Selected survey questions and response formats

No.	Survey items	Response format
Q1	Do you think chemical management is difficult for small businesses?	4-point Likert scale with "Don't know" option
Q2	What do you think are the reasons why chemical management is difficult for small businesses?	Multiple-choice nominal scale
Q3	What services do you currently provide for chemical management at the businesses you visit?	Multiple-choice nominal scale
Q5	What do you think are the biggest factors affecting chemical management in small businesses? (Select 3)	Multiple-choice nominal scale
Q6	Do you feel chemical management is necessary for small businesses?	4-point Likert scale with "Don't know" option
Q7	Do you think the government needs to establish a separate chemical management support program for small businesses?	4-point Likert scale with "Don't know" option
Q8	If a chemical management support program is to be established for small businesses, what content should the government include? Please refer to the examples.	Open-ended
Q12	Do you think working environment measurement and special health examination systems are generally effective for protecting workers' health?	5-point Likert scale with "Don't know" option
Q13	Do you think working environment measurement results are being utilized for actual work environment improvement?	5-point Likert scale with "Don't know" option
Q14	Do you think the follow-up management of those with findings/those under observation by special health examinations is being handled appropriately?	5-point Likert scale with "Don't know" option
Q15	Do you think the results of working environment measurements and special health examinations are being properly communicated and explained to workers?	5-point Likert scale with "Don't know" option
Q16	Do you think current occupational health systems (working environment measurement, special health examination, risk assessment, etc.) contribute to improving employers' awareness of chemical hazards and risks?	5-point Likert scale with "Don't know" option
Q17	Please add any points that need to be improved regarding the working environment measurement and special health examination systems.	Open-ended
Q18	Are workers in the businesses you visit able to express to you their discomfort with chemical use?	4-point Likert scale
Q19	Do business owners or safety and health managers in the businesses you visit openly discuss their difficulties with chemical management?	4-point Likert scale
Q20	Do you think you have developed a close (or trusting) relationship with business owners where they can readily discuss chemical handling operations?	4-point Likert scale with "Don't know" option
Q21	Have you received questions about chemical hazards and risks from business managers when they purchase or plan to use new chemicals?	5-point Likert scale
Q22	What activities do you think should be carried out to build a close (or trusting) relationship with occupational health services or service providers?	Multiple-choice nominal scale
Q23	What do you think is important for building a close (or trusting) relationship with business owners? Please write freely.	Open-ended
Q24	The Ministry of Labor has enforced laws mainly through punishment and regulations (labor inspection). Do you think this has made it difficult for small businesses?	4-point Likert scale with "Don't know" option
Q25	Do you check for new chemicals in the small businesses you visit?	4-point Likert scale

**Table S1.** Continued

No.	Survey items	Response format
Q26	Do you check the hazards of new chemicals in the small businesses you visit?	4-point Likert scale
Q27	When visiting small businesses, do you check the exposure patterns for each chemical by work task?	4-point Likert scale
Q28	Do you typically propose qualitative (e.g., risk assessment, bulk sample analysis) and quantitative (e.g., measurement, biomonitoring) assessments to most small businesses?	4-point Likert scale
Q30	What are the reasons when you are unable to identify chemical use status, hazards, and work-specific exposure patterns, or propose assessment and management measures in the small businesses you visit?	Open-ended
Q32	What are the top three things that come to mind when you think of 'occupational health services'?	Multiple-choice nominal scale
Q33	What level do you think your knowledge about chemicals is at?	Ordinal scale
Q45	Were you satisfied with the costs of government support programs?	4-point Likert scale with "Don't know" and "Not applicable" options
Q46	Were you satisfied with how the government support programs were conducted?	4-point Likert scale with "Don't know" and "Not applicable" options
Q48	Do you think the current government support programs help improve business owners' awareness of chemical management?	4-point Likert scale with "Don't know" and "Not applicable" options
Q51	Are you satisfied with the current evaluation methods for agencies implementing government support program?	4-point Likert scale with "Don't know" and "Not applicable" options
Q54	Do you think the current government support programs include content that small businesses actually need?	4-point Likert scale with "Don't know" and "Not applicable" options

Note 1: The item numbers (No.) correspond to the original survey question numbers.

**Table S2.** Survey Results: Current Status and Improvement Suggestions for Chemical Management in Small Businesses

No.	Response	Frequency	Percentage (%)
Q1	Strongly agree	37	38.95
	Somewhat agree	52	54.74
	Somewhat disagree	4	4.21
	Strongly disagree	1	1.05
	Don't know	1	1.05
	Total	95	100
Q2	Business owners are indifferent (only interested in production and sales activities)	74	77.89
	Business owners don't know the hazards of chemicals	44	46.32
	Business owners think chemicals are not dangerous and are unlikely to cause accidents or illnesses	40	42.11
	Business owners are interested but lack resources (workforce, funds, time) to manage chemicals	35	36.84
	Business owners are interested but don't know what to do specifically and don't make active efforts to learn	27	28.42
	Business owners are interested and try to utilize external resources and training, but can't properly implement due to complex and difficult legal requirements	23	24.21
	Small businesses lack resources to utilize (information provision, cost support, technical support, training, etc.)	22	23.16
	Small businesses are difficult to access, making it impossible for external experts to provide chemical management services	16	16.84
	Fundamental chemical management is difficult because business owners only try to comply with legal requirements	9	9.47
	Other	8	8.42
Q3	MSDS acquisition and management guidance	87	91.58
	Chemical hazard/risk classification and guidance	82	86.32
	Chemical and product list creation and guidance	36	37.89
	Information provision and guidance on carcinogen substitution	35	36.84
	Chemical hazard promotion leaflets (printed materials, handouts, documents, etc.), provision of warning signs and guidance	34	35.79
	Working environment measurement and special health examination implementation guidance	33	34.74
	Chemical risk assessment and guidance	31	32.63
	Education and guidance	23	24.21
	Other	12	12.63
Q5	Business owner's intentions	85	89.47
	Legal regulations	67	70.53
	Ministry of Labor inspection	47	49.47
	Environmental improvement	29	30.53
	Customer/parent company requirements	23	24.21
	Employee health and safety	20	21.05
	Ministry of Environment inspection	11	11.58
	Worker symptom complaints, etc.	2	2.11
	Other	1	1.05
Q6	Strongly agree	65	68.42
	Somewhat agree	30	31.58
	Somewhat disagree	0	0
	Strongly disagree	0	0
	Don't know	0	0
	Total	95	100
Q7	Strongly agree	50	52.63
	Somewhat agree	43	45.26
	Somewhat disagree	2	2.11
	Strongly disagree	0	0
	Don't know	0	0
	Total	95	100

**Table S3.** Survey Results: Opinions on Working Environment Measurement and Special Health Examination Systems

No.	Response	Frequency	Percentage (%)
Q12	Strongly disagree	1	1.05
	Somewhat disagree	11	11.58
	Neither agree nor disagree	23	24.21
	Somewhat agree	27	28.42
	Strongly agree	33	34.74
	Don't know	0	0
	Total	95	100
Q13	Strongly disagree	6	6.32
	Somewhat disagree	24	25.26
	Neither agree nor disagree	29	30.53
	Somewhat agree	26	27.37
	Strongly agree	9	9.47
	Don't know	1	1.05
	Total	95	100
Q14	Strongly disagree	5	5.26
	Somewhat disagree	26	27.37
	Neither agree nor disagree	29	30.53
	Somewhat agree	28	29.47
	Strongly agree	3	3.16
	Don't know	4	4.21
	Total	95	100
Q15	Strongly disagree	9	9.47
	Somewhat disagree	39	41.05
	Neither agree nor disagree	23	24.21
	Somewhat agree	20	21.05
	Strongly agree	3	3.16
	Don't know	1	1.05
	Total	95	100
Q16	Strongly disagree	4	4.21
	Somewhat disagree	27	28.42
	Neither agree nor disagree	28	29.47
	Somewhat agree	29	30.53
	Strongly agree	7	7.37
	Don't know	0	0
	Total	95	100

**Table S4.** Survey Results: Relationship Building between Small Businesses and Occupational Health Services

No.	Response	Frequency	Percentage (%)
Q18	Strongly disagree	8	8.42
	Somewhat disagree	29	30.53
	Somewhat agree	47	49.47
	Strongly agree	11	11.58
	Total	95	100
Q19	Strongly disagree	16	16.84
	Somewhat disagree	32	33.68
	Somewhat agree	34	35.79
	Strongly agree	13	13.68
	Total	95	100
Q20	Strongly disagree	4	4.21
	Somewhat disagree	32	33.68
	Somewhat agree	47	49.47
	Strongly agree	6	6.32
	Don't know	6	6.32
	Total	95	100
Q21	Strongly disagree (Not a service target item or no interest at all)	10	10.53
	Somewhat disagree (Rarely asks questions, only asks when there are special issues like accidents)	34	35.79
	Neither agree nor disagree (Sometimes asks only about substances that seem to have hazards/risks)	29	30.53
	Somewhat agree (Only asks when the manager visits the workplace)	16	16.84
	Strongly agree (Looks up chemical hazards/risks independently and asks whenever new chemicals are brought in)	6	6.32
	Total	95	100
Q22	Increase familiarity through consistent and continuous visits	46	48.42
	Develop an occupational health program suitable for the industry type to generate interest	40	42.11
	Respond kindly to avoid giving the impression of criticism	39	41.05
	Focus on actual health management activities rather than just paperwork-centered activities	27	28.42
	Other	25	26.32

**Table S5.** Survey Results: Service Provider and Government Roles and Required Capabilities

No.	Response	Frequency	Percentage (%)
Q24	Strongly agree	15	15.79
	Somewhat agree	41	43.16
	Somewhat disagree	22	23.16
	Strongly disagree	13	13.68
	Don't know	4	4.21
	Total	95	100
Q25	Strongly agree	44	46.32
	Somewhat agree	38	40
	Somewhat disagree	12	12.63
	Strongly disagree	1	1.05
	Total	95	100
Q26	Strongly agree	42	44.21
	Somewhat agree	44	46.32
	Somewhat disagree	9	9.47
	Strongly disagree	0	0
	Total	95	100
Q27	Strongly agree	37	38.95
	Somewhat agree	42	44.21
	Somewhat disagree	15	15.79
	Strongly disagree	1	1.05
	Total	95	100
Q28	Strongly agree	15	15.79
	Somewhat agree	35	36.84
	Somewhat disagree	35	36.84
	Strongly disagree	10	10.53
	Total	95	100
Q32	Working environment measurement	83	87.37
	Special health examination	82	86.32
	MSDS management	62	65.26
	Personal protective equipment management	18	18.95
	Risk assessment	9	9.47
	Local exhaust ventilation inspection	9	9.47
	Chemical hazard and risk classification	8	8.42
	Other	8	8.42
	Carcinogen substitution	3	3.16
	Engineering controls	3	3.16
Q33	Sufficient knowledge to identify hazards and provide specific guidance	28	29.47
	Can conduct assessments such as identifying hazardous chemicals like thermal decomposition products beyond the components listed in MSDS	6	6.32
	Can find and provide guidance on domestic and international research results and occupational disease cases	8	8.42
	Can find substitution information for highly toxic substances such as carcinogens	27	28.42
	Can identify hazards but not very familiar with specific exposure prevention measures due to their complexity	13	13.68
	Have general occupational health knowledge rather than specific chemical hazard knowledge	50	52.63
	Somewhat lacking in general occupational health knowledge such as processes and hazards	15	15.79
	Have certification but not very familiar with related knowledge and skills	1	1.05

**Table S6.** Survey Results: Experience with Government Support Programs for Small Businesses

No.	Response	Frequency	Percentage (%)
Q45	Not at all satisfied	14	14.74
	Somewhat dissatisfied	31	32.63
	Somewhat satisfied	16	16.84
	Very satisfied	0	0
	Don't know	3	3.16
	No experience with government support programs	31	32.63
	Total	95	100
Q46	Not at all satisfied	11	11.58
	Somewhat dissatisfied	31	32.63
	Somewhat satisfied	20	21.05
	Very satisfied	1	1.05
	Don't know	1	1.05
	No experience with government support programs	31	32.63
	Total	95	100
Q48	Not at all satisfied	1	1.05
	Somewhat dissatisfied	23	24.21
	Somewhat satisfied	35	36.84
	Very satisfied	3	3.16
	Don't know	2	2.11
	No experience with government support programs	31	32.63
	Total	95	100
Q51	Not at all satisfied	10	10.53
	Somewhat dissatisfied	31	32.63
	Somewhat satisfied	17	17.89
	Very satisfied	1	1.05
	Don't know	5	5.26
	No experience with government support programs	31	32.63
	Total	95	100
Q54	Not at all satisfied	7	7.37
	Somewhat dissatisfied	28	29.47
	Somewhat satisfied	24	25.26
	Very satisfied	3	3.16
	Don't know	2	2.11
	No experience with government support programs	31	32.63
	Total	95	100