Supplementary Material

Combined inhalation exposure to retail insecticides for preschool children and children based on household usage patterns

Joo-hyon Kim, A,B Moon-young Hwang and Myunghee Kwon B

^ADivision of Chemical Research, The National Institute of Environmental Research, Hwangyeong-ro 42, Seo-gu, Incheon, 22689, South Korea.

^BCorresponding author. Email: jhkim0318@korea.kr

Table S1. The full online Questionnaire for household use of insecticides

O research institute: National Institute of Environmental Research





o survey company : World re	esearch	
I . Demographi	c information	
7 wolsan 8 kyungi-do	province? 3 daegu	o 🗓 chungnam-do
SQ2. what is your age?	years	
SQ2-1. ages datail ① 19year~29year ② 30y SQ3. sex ① male ② fer	year ③ 40year ④ 50year +	
II. environmental e	xposure – living environm	nent
SQ4. house information?		
 single-family house residential complex 	② multi-family house⑤ others()	③ apartment
SQ5. size of house?		
① 10pyong below④ 30pyong ~ 40pyong	2 10pyong ~ 20pyong5 40pyong ~ 50pyong	., -
SQ6. how many family memb 1 1member 2 2 5 5members 6 6members	members 3 3members	④ 4members
SQ7. do you have preschool	children below 5 years old in y	our family?
① yes()	② no	
SQ7-1. Detail of members of	families	

	_			birth year & age working day average indoor time at home non-working day				
NO	member details	sex	birth year & age			occupation	average time in working place(occupation al place)	
01		① male ②	year_(or)age	hr	hr		hr	
		female	(ii)					
02		① male ②	year (or)age	hr	hr		hr	
02		female	year (Or) age					
03		① male ②	1/22r (2r) 2.72	hr	hr		hr	
03		female	year (or)age					
04		① male ②	year_(or)age	hr	hr		hr	
04		female	year (or)age					
05		① male ②	V00" (0")	h.	h		hr	
05		female	year (or)age	hr	<u>hr</u>		hr	
0.0		① male ②		le se	la		L.	
06		female	year (or)age	hr	<u>hr</u>		hr	
07		① male ②	, (or)	la	la		L.	
07		female	year (or)age	<u>hr</u>	<u>hr</u>		hr	

SQ8. how many rooms	are there	in yo	ur home?
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① 1ea ② 2ea ③ 3ea ④ 4ea ⑤ 5ea ⑥ 6ea	a +
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Ⅲ. Demographic characteristics

SQ9. education-academic	background?
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① ~middle school	② ~high school	③ ~college
4 _ university	⑤ ~graduate school	

SQ10. average monthly income?

1	~1000000won	② 1000000-2000000won ③	2000000-3000000won
4	3000000-4000000won	⑤ 4000000-5000000won	6 5000000won +

SQ11. occupation information?

(1)	protession	2 business m	nanagement	3 office work	(4) sale related
(5)	factory work	6 sel	f-employment	⑦ housewife ⑧	student
9	official or govern	ment work	10 non-occup	ation	

part 1. Household Insecticides

question1. Have you ever used for last 1year mosquito insecticides?

① yes 🖙 (to q1-1)

② no



q1-1) what kinds of mosquito insecticides have you used? choose every products (can choose multiple products)



q1-2) what was products name you used? size, volume of products, write detail.

application types of products	products name (manufacturing company)
① spray type (aerosol spray)	
② electric matt vaporizer	
③ electric liquid vaporizer	
4 mosquito coil	

q1-3) [use frequency] how often have you used?

factors	application types of products	seasons	times			
	① spray type (aerosol	summer(JUN~ SEP)	① 1day ② 1week ③ 1month	() times		
	spray)	spring, autumn, winter	① 1week ② 1month ③ 6month	() times		
	② electric matt	summer(JUN~ SEP)	① 1day ② 1week ③ 1month	() times		
	vaporizer	spring, autumn, winter	① 1week ② 1month ③ 6month	() times		
	③ electric liquid	summer(JUN~ SEP)	① 1day ② 1week ③ 1month	() times		
	vaporizer	spring, autumn, winter	① 1week ② 1month ③ 6month	() times		
	(A mosquito soil	summer(JUN~ SEP)	① 1day ② 1week ③ 1month	() times		
	4 mosquito coil	spring, autumn, winter	① 1week ② 1month ③ 6month	() times		

							octi.								t		f_	ctorc			
		produ	cts	throug	gh	inhala	atio	n an	d	dermal	contact										
q	ղ1-4)	[time	of	use]	*	time	of	use	:	mean	exposure	time	from	products,	chemicals	of	products	when	you	used	

questions	application types	factors
mean time for using products per one time? (average total time of using insecticides at home)	① spray type (aerosol spray)	hr min
mean time for using products per one time? (average total time of turning on electric vaporizers at home)	② electric matt vaporizer	hr min
mean time for using products per one time? (average total time of turning on electric vaporizers at home)	③ electric liquid vaporizer	hr min
mean time for using products per one time? (average total time of burning mosquito coils at home)	④ mosquito coil	hr min

q1-5) [use amount and spaying time] mean used amount and (or) spraying time per use?

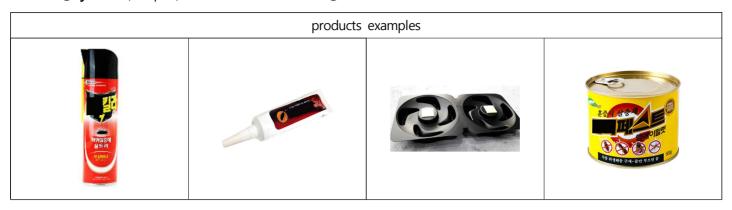
questions	application types	factors
time of press button of aerosol spray products for spraying task per one use?	① spray type (aerosol spray)	mean spray per second

q1-6)	which places did you use insecticides per use? (can check multiple answers) ① bed room ② living room ③ toilet, bath room ④ etc()
q1-7)	did you read products information, cautious direction, ingredients information? ① yes ② no
q1-8)	feel stimulation, pain, irritation, and others? (can check multiple answers) 1 eyes 2 nose 3 skin 4 neck 5 no

question2. Have you ever used for last 1year cockroach insecticides?

① yes 🖙 (to q2-1)

② no



q2-1) what kinds of **cockroach insecticides** have you used? choose every products (can choose multiple products)

① gel type	② spray type (aerosol spray)	③ stationary traps type	④ fogging spray by one time use
O SI	Travell 8 to 1999		THE THE SHEET FORE

q2-2) what was products name you used? size, volume of products, write detail.

application types of products	products name (manufacturing company)
① gel type	
② spray type (aerosol spray)	
③ stationary traps type	
④ fogging spray by one time use	

q2-3) [use frequency] how often have you used?

factors	application types of products	times	use frequency
	① gel type	① week ② 1month ③ 6months ④ 1year	() times
use	② spray type (aerosol spray)	① week ② 1month ③ 6months ④ 1year	() times
frequency	③ stationary traps type	① week ② 1month ③ 6months ④ 1year	() times
	④ fogging spray by one time use	① week ② 1month ③ 6months ④ 1year	() times

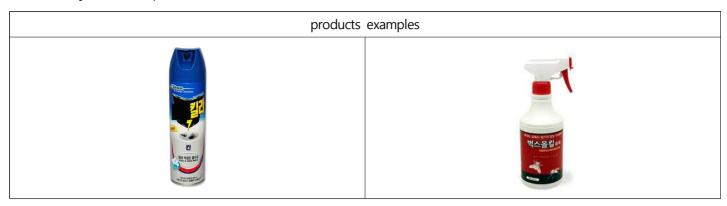
questions	application types	factors
mean time for using products per one time? (including task time, total time for using insecticide:	① gel type	min sec
mean time for using products per one time? (including task time, total time for using insecticide:	② spray type (aerosol spray)	min sec
mean time for using products per one time? (including task time, total time for using insecticide:	③ stationary traps s) type	min sec
mean time for using products per one time? ((average total time of turning on fogging spray, treating time, cleaning places and other task after finishing use)	4 fogging spray by one time use	hr min sec
5) [use amount and spaying time] mean used amoun	nt and (or) spraying time p	er use?
questions	application types	factors
how long time took it to use up gel type products?	application types ① gel type	factors mean month
how long time took it to use up gel type products?		mean month
how long time took it to use up gel type products? time of press button of aerosol spray products for	 gel type spray type (aerosol 	mean month
how long time took it to use up gel type products? time of press button of aerosol spray products for spraying task per one use? how many stationary traps did you used per one	① gel type ② spray type (aerosol spray)	mean month mean spray per second

① eyes ② nose ③ skin ④ neck ⑤ no

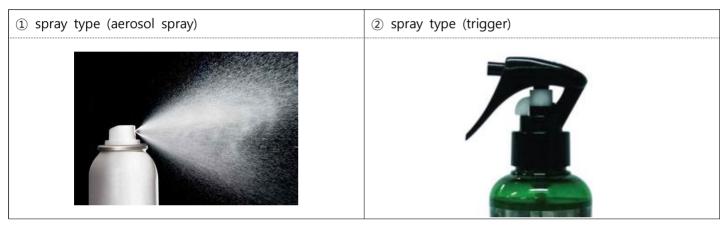
question3. Have you ever used for last 1year house fly insecticides?

① yes (to q3-1)

② no



q3-1) what kinds of house fly-insecticides have you used? choose every products (can choose multiple products)



q3-2) what was products name you used? size, volume of products, write detail.

application types of products	products name (manufacturing company)
① spray type (aerosol spray)	
② spray type (trigger)	

q3-3) [use frequency] how often have you used?

factors	application types	seasons	times	use frequency
	① spray type (aerosol	summer(JUN~ SEP)	① 1day ② 1week ③ 1month	() times
use	spray)	spring, autumn, winter	① 1week ② 1month ③ 6month	() times
frequency		summer(JUN~ SEP)	① 1day ② 1week ③ 1month	() times
	② spray type (trigger)	spring, autumn, winter	① 1week ② 1month ③ 6month	() times

questions application types factors ime of press button of aerosol spray products for spraying task per one use? fumber of triggering actions for task per one use? 2 spray type (trigger) mean spray per secon mean		questions		application types	factors
questions application types factors questions application types factors ime of press button of aerosol spray products for spraying task per one use? questions application types factors mean spray per secon mean spra	how long time did	you use insecticides p	per use?		
time of press button of aerosol spray products for spraying task per one use? 1 spray type (aerosol spray) mean spray per secon spray) spray type (trigger) mean times 1 spray type (trigger) mean spray per secon mean s	how long time did	you use insecticides p	per use?	② spray type (trigger)	hr min
time of press button of aerosol spray products for spraying task per one use? 1 spray type (aerosol spray) mean spray per secon spray) spray type (trigger) mean times 1 spray type (trigger) mean spray per secon mean s	-5) [use amount and	spaying time] mean use	ed amount	and (or) spraying time pe	er use?
spraying task per one use? spray) mean spray per seconumber of triggering actions for task per one use? ② spray type (trigger) mean times 8-6) which places did you use insecticides per use? (can check multiple answers) ① bed room ② living room ③ toilet, bath room ④ etc() 8-7) did you read products information, cautious direction, ingredients information? ② yes ② no 8-8) feel stimulation, pain, irritation, and others? (can check multiple answers)	C	questions		application types	factors
3-6) which places did you use insecticides per use? (can check multiple answers) ① bed room ② living room ③ toilet, bath room ④ etc() 3-7) did you read products information, cautious direction, ingredients information? ① yes ② no 3-8) feel stimulation, pain, irritation, and others? (can check multiple answers)	•	. , .			mean spray per secon
① bed room ② living room ③ toilet, bath room ④ etc() 3-7) did you read products information, cautious direction, ingredients information? ② yes ② no 3-8) feel stimulation, pain, irritation, and others? (can check multiple answers)	number of triggering	actions for task per o	ne use?	② spray type (trigger)	mean times
3-8) feel stimulation, pain, irritation, and others? (can check multiple answers) ① eyes ② nose ③ skin ④ neck ⑤ no		ucts information, cautio			?
① eyes ② nose ③ skin ④ neck ⑤ no	•	2 110			
	① yes	_	rs? (can che	eck multiple answers)	
	① yes -8) feel stimulation, pa	ain, irritation, and other			
	① yes -8) feel stimulation, pa	ain, irritation, and other			

question4. Have you ever used for last 1year house ant insecticides?

① yes (to q4-1)

② no



q4-1) what kinds of house ant insecticides have you used? choose every products (can choose multiple products)



q4-2) what was products name you used? size, volume of products, write detail.

1 / 1	
application types of products	products name (manufacturing company)
① spray type (aerosol spray)	
② spray type (trigger)	
③ gel type	
4 powder type	

q4-3) [use frequency] how often have you used?

factors	application types of products	times	use frequency		
	① spray type (aerosol spray)	① week ② 1month ③ 6months ④ 1year	() times		
use frequency	② spray type (trigger)	① week ② 1month ③ 6months ④ 1year	() times		
	③ gel type	① week ② 1month ③ 6months ④ 1year	() times		
	④ powder type	① week ② 1month ③ 6months ④ 1year	() times		

q4-4)	[time	of	use]	*	time	of	use	:	mean	exposure	time	from	products,	chemicals	of	products	when	you	used
	produ	cts	throu	gh	inhala	atio	n and	d d	dermal	contact									

questions	application types	factors
mean time for using products per one time? (average total time of using insecticides including task time at home)	① spray type (aerosol spray)	hr min
mean time for using products per one time? (average total time of using insecticides including task time at home)	② spray type (trigger)	hr min
mean time for using products per one time? (average total time of using insecticides including task time at home)	③ gel type	hr min
mean time for using products per one time? (average total time of using insecticides including task time at home)	④ powder type	hr min

q4-5) [use amount and spaying time] mean used amount and (or) spraying time per use?

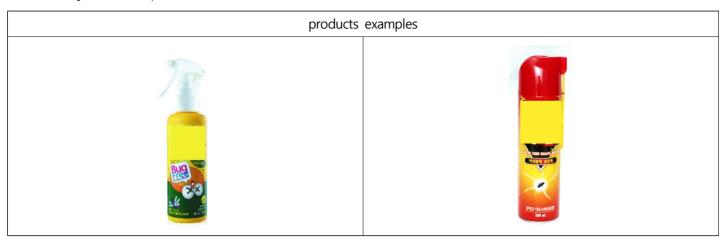
questions	application types	factors
time of press button of aerosol spray products for spraying task per one use?	① spray type (aerosol spray)	mean spray per second
number of triggering actions to use insecticides per one use?	② spray type (trigger)	mean times
how long time took it to use up gel type products?	③ gel type	mean month
how many spoons(5ml) did you use to use insecticides per one use?	④ powder type	mean spoons

q4-6)	which places did you use insect ① bed room ② living room	•	•
q4-7)	did you read products informati ① yes ②	3	edients information?
q4-8)	feel stimulation, pain, irritation, ① eyes ② nose ③		tiple answers)

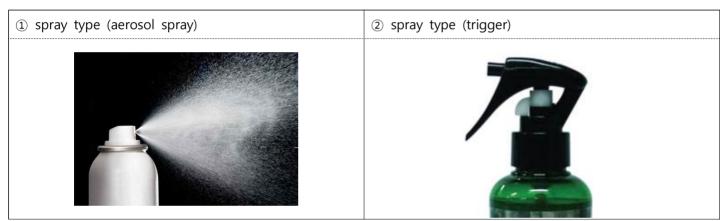
question5. Have you ever used for last 1year bedbug and flea insecticides?

① **yes** (to q5-1)

2 no



q5-1) what kinds of <u>bedbug and flea insecticides</u> have you used? choose every products (can choose multiple products)



q5-2) what was products name you used? size, volume of products, write detail.

application types of products	products name (manufacturing company)
① spray type (aerosol spray)	
② spray type (trigger)	

q5-3) [use frequency] how often have you used?

factors	application types	seasons	times	use frequency
	① spray type (aerosol	summer(JUN~ SEP)	① 1day ② 1week ③ 1month	() times
use	spray)	spring, autumn, winter	① 1week ② 1month ③ 6month	() times
frequency		summer(JUN~ SEP)	① 1day ② 1week ③ 1month	() times
	② spray type (trigger)	spring, autumn, winter	① 1week ② 1month ③ 6month	() times

how long time did	you use insecticides per use you use insecticides per use spaying time] mean used amo	spray)	min sec
5-5) [use amount and		? ② spray type (trigger)	min sec
	spaying time] mean used amo		
		ount and (or) spraying time p	er use?
`	questions	application types	factors
	of aerosol spray products for ask per one use?	① spray type (aerosol spray)	mean spray per second
	g actions to use insecticides r one use?	② spray type (trigger)	mean times
① bed room ②	vou use insecticides per use? (living room ③ toilet, b lucts information, cautious dire ② no	eath room ④ etc()	1?
i-8) feel stimulation, p	ain, irritation, and others? (can	check multiple answers)	
① eyes ② nos	e ③ skin ④ neck	⑤ no	

question6. Have you ever used for last 1year bed mite insecticides?

① yes 🖙 (to q6-1)

② no



q6-1) what kinds of bed mite insecticides have you used? choose every products (can choose multiple products)



q6-2) what was products name you used? size, volume of products, write detail.

application types of products	products name (manufacturing company)
① spray type (aerosol spray)	
② spray type (trigger)	
③ patch sheet type	

q6-3) [use frequency] how often have you used?

factors	application types of products	times	use frequency
	① spray type (aerosol spray)	① week ② 1month ③ 6months ④ 1year	() times
use frequency	② spray type (trigger)	① week ② 1month ③ 6months ④ 1year	() times
	③ patch sheet type	① week ② 1month ③ 6months ④ 1year	() times

		rom products, chemic	als of products when you use
questions		application types	factors
how long time did you use insecticides per use?	- 1	spray type (aerosol oray)	min sec
how long time did you use insecticides per use?	2) spray type (trigger)	min sec
how long time did you use insecticides per use?	3) patch sheet type	min sec
q6-5) [use amount and spaying time] mean used amou	nt and	(or) spraying time pe	er use?
questions	a	pplication types	factors
time of press button of aerosol spray products for spraying task per one use?	① sp spray)	ray type (aerosol)	mean spray per second
number of triggering actions to use insecticides per one use?	② sp	oray type (trigger)	mean times
how many sheet did you use to use insecticides per one use?	③ ра	atch sheet type	mean sheets
q6-6) [exposure time] * time of exposure : mean exposure products through inhalation and dermal contact	re time	from products, chem	icals of products when you used
questions		application types	factors
how long time did you use had/blanket etc treated	by (· · · · · · · · · · · · · · · · · · ·	
how long time did you use bed/blanket etc treated insecticides per day?	-	spray type (aerosc spray)	hr min
	by		hr min
insecticides per day? how long time did you use bed/blanket etc treated	by (spray)	hr min

** Thank you for your effort **