

Household Disinfectant Use in the Era of Covid-19 and Asthma Control among Adults with Asthma

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BACKGROUND

- Covid-19 pandemic has greatly impacted people globally
- Asthma affects over 19 million US adults
- Uncontrolled asthma leads to substantial health/economic impact
- Cleaning/disinfecting prevent COVID-19 spread
- Chemicals from disinfecting products may trigger asthma symptoms
- Increased time indoors may increase household exposures to chemicals from cleaning/disinfecting products

PURPOSE

- Assess levels of household cleaning/disinfecting practices and changes in these practices associated with Covid-19
- Examine associations of household cleaning/disinfecting with asthma control

METHODS

DESIGN:

- Global Covid-19 and Asthma Study (GCAS): Online cross-sectional study distributed online (e.g., email, social media, ResearchMatch)

SAMPLE:

- 18 years or older; can communicate in English
- Have asthma previously diagnosed by a health professional
- Over 700 participants responded by 8/7/2020

HISTORY OF ASTHMA:

- Have you ever been told by a health professional that you have asthma

ASTHMA CONTROL TEST (ACT):

- 5 items: asthma symptoms, use of medications, etc.
- 5 response options with scores from 1-5
- ACT scores: ≤ 19 (uncontrolled asthma) vs. ≥ 20 (controlled asthma)

HOME ENVIRONMENTAL EXPOSURES:

- No. of times participant/anyone in the home used different types of disinfectants before and since Covid-19.
- Responses dichotomized as ≥5 vs. <5

STATISTICAL ANALYSIS:

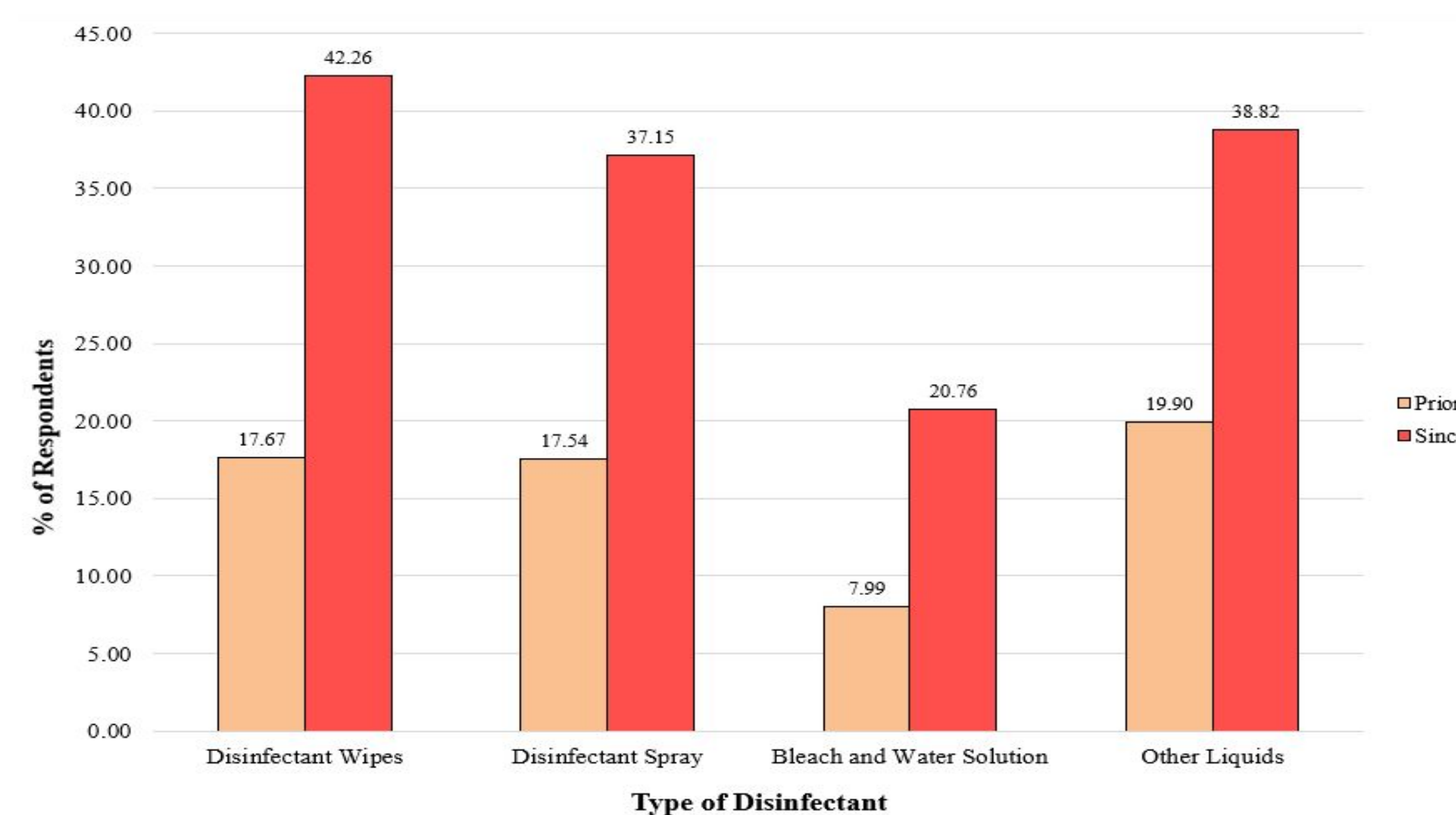
- Descriptive statistics
- Binary logistic regression analyses predicting the odds of uncontrolled asthma
- Chi squared statistics
- SAS 9.4 used for data analysis

RESULTS

Sample Characteristics

Variable	n	%
Age in years (Mean, SD)	~43	~15
Highest Level of Education		
High School or Less	71	9.29
Some College or 2-Year Degree	145	18.98
4-Year College	172	22.51
Post College/graduate or professional	376	49.21
Gender		
Male	158	20.76
Female	592	77.79
Race/Ethnicity		
White	611	80.29
Non-white	150	19.71
Country of Residence		
United States	704	92.39
Other country	58	7.61
Residential Area		
Large city or suburb	448	58.64
Small city, town, or rural area	316	41.36
Home Ownership		
Rent	240	31.45
Own	410	53.74
Live with family/friends	100	13.11
Other	13	1.70
Asthma Control Test Score		
19 or less	324	42.58
20 or higher	437	57.42

Household Use of Disinfectants ≥5 Times per Week Prior and Since Covid-19



RESULTS

Percent Reporting Household Disinfectant Use ≥5 Times per Week since Covid-19 by Participant Characteristics

Variable	Disinfectant Wipes (%)	Disinfectant Sprays (%)	Disinfectant Water & Bleach (%)	Other Liquids (%)
Highest Level of Education				
High School or Less	68.57*	60.29*	52.11*	61.97*
Some College or 2-Year Degree	42.07	40.69	20.14	37.50
4-Year College	37.43	34.50	18.02	32.16
Pos College/professional	39.63	32.8	16.31	37.97
Gender				
Male	39.87	34.39	27.22*	32.28
Female	42.71	38.10	19.52	40.65
Race/Ethnicity				
White	41.22	34.98*	18.56*	37.17*
Non-white	46.67	46.00	30.20	46.31
Country of Residence				
United States	41.88	36.34	19.4*	38.37
Other country	44.83	44.83	37.93	45.61
Residential Area				
Large city or suburb	39.29*	32.44*	16.78*	35.79*
Small city, town, or rural area	46.50	43.91	26.43	43.13
Home Ownership				
Rent	37.08*	38.91*	19.17*	37.92
Own	41.81	31.94	17.69	37.44
Live with family/friends	58.00	55.00	37.00	47.00
Other	30.77	30.77	23.08	38.46

Association of Household Disinfectant Use ≥5 Times per Week since Covid-19 with Uncontrolled Asthma- All Participants

Disinfectant Type	Crude		Adjusted ^a	
	OR	95% CI	OR	95% CI
Disinfectant Wipes	1.72*	1.28-2.31	1.47**	1.05-2.05
Disinfectant Sprays	1.58*	1.17-2.14	1.17	0.83-1.65
Disinfectant Water and Bleach	2.14*	1.49-3.05	1.29	0.85-1.95
Other Liquids	1.52*	1.13-2.05	1.30	0.93-1.82

^a Adjusted for education, sex, race/ethnicity, country of residence, residential area, home ownership, and health insurance p-value <0.01 ** p-value 0.02

Association of Household Disinfectant Use ≥5 Times per Week since Covid-19 with Uncontrolled Asthma- US Participants

Disinfectant Type	Crude		Adjusted ^a	
	OR	95% CI	OR	95% CI
Disinfectant Wipes	1.94*	1.42-2.66	1.68**	1.18-2.38
Disinfectant Sprays	1.79*	1.3-2.46	1.36***	0.95-1.94
Disinfectant Water and Bleach	2.35*	1.6-3.44	1.48***	0.95-2.3
Other Liquids	1.72*	1.25-2.35	1.53**	1.08-2.18

^a Adjusted for education, sex, race/ethnicity, residential area, home ownership, and health insurance p-value <0.001 ** p-value <0.05 *** p-value <0.1

DISCUSSION

- Frequency of cleaning/disinfecting among individuals with asthma has increased dramatically since Covid-19
- Less educated, non-white, and those living in small cities or in non-urban areas reported using disinfectants more often
- More frequent disinfectant use was associated with uncontrolled asthma, especially among US-based participants
- Findings consistent with limited data suggesting increased use of disinfectants and non-recommended practices in the US
- In line with studies linking air pollutants such as used in cleaning/disinfecting with asthma symptoms

IMPLICATIONS

- Public messaging should recognize potential impact of cleaning/disinfecting practices on people with asthma
- Messaging should provide alternative safer disinfecting options for those with asthma and allergic conditions
- Findings will guide research and interventions to decrease use of disinfectants, especially in underserved and less educated

LIMITATIONS & STRENGTHS

LIMITATIONS:

- Cross-sectional study with convenience sample
- Limited to English speakers with relatively high socioeconomic status

STRENGTHS:

- One of the first addressing impact of disinfectant use due to Covid-19 on adults with asthma
- Global: wide geographic distribution

ACKNOWLEDGEMENTS & INVITATION

- Thank you to research participants as well as colleagues and organizations that shared the survey invitation.
- Study still ongoing. Please participate and/or share the study invite: GCAS: [Global COVID-19 and Asthma Study](https://redcap.kumc.edu/surveys/?s=PAM4ANK3KH) or <https://redcap.kumc.edu/surveys/?s=PAM4ANK3KH>
- Questions: keldei1@uic.edu

