

## **Knowledge, Attitude, and Practices (KAP) Towards COVID-19 among Older People Living in Informal Settlements in Nairobi City, Kenya**

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*Informal settlements in developing countries such as Kenya are the least prepared to deal with COVID-19 pandemic due to lack of basic housing, water and sanitation, and overcrowding. The risk is magnified for older people in such an environment due to their advanced age that compromises their immune system, and the fact that they are more likely to have pre-existing health conditions which weaken their body's ability to fight infectious diseases. This study sought to establish older people's knowledge levels, perception, and risk assessment with regard to COVID-19, and adherence to prevention measures. A cross-sectional survey was conducted among 150 respondents aged 60 years and above from two selected informal settlements in the city of Nairobi during the month of August 2020. Primary data were collected using questionnaire and analyzed using descriptive statistics that involved the use of frequencies, totals and percentages. Knowledge of dry cough and fever as COVID-19 symptoms was high, but only 31.5% listed difficulty in breathing. Slightly over half correctly identified elderly people as being at greatest risk of getting severely sick from COVID-19. About 60% were aware that they are at risk of contracting COVID-19. Strong religious belief was the main reason among those who believed they are not at risk. Wearing face masks and hand-washing using soap were the main prevention measures adopted. In conclusion, the study revealed that knowledge about some key symptoms of COVID-19 is still low, and that a considerable number of older people do not think that elderly people are at great risk of getting severely sick. Misconception that a strong religious belief can protect one from contracting the disease is still common among older people. There is, therefore, need for well-tailored and contextualized awareness campaigns to reach this high risk group.*

**Keywords:** COVID-19, older people, slums, knowledge, behavior

### **Introduction**

Coronavirus belongs to a family of respiratory viruses that cause common cold, Middle-East Respiratory Syndrome (MERS) and the Severe Acute Respiratory Syndrome (SARS), all of which are zoonotic in origin and induce fatal lower respiratory tract infection as well as extrapulmonary manifestations (Karijo et al. 2020, Chen et al. 2020). The new COV, the coronavirus disease (COVID-19), was isolated and referenced as severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) (Adhikari et al. 2020, Karijo et al. 2020). Its clinical manifestations include fever, fatigue, dry cough, shortness of breath, and acute respiratory distress

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syndrome (Chen et al. 2020).

COVID-19 pandemic is wreaking havoc across the globe, causing a global health crisis due to its rapid onset, spatial extent and complex consequences (Cheval et al. 2020). Six major pandemic and epidemic outbreaks have swept the planet between 2000 and 2019, namely Severe Acute Respiratory Syndrome (SARS) (2002–2004), H1N1 influenza (2009), Middle East respiratory syndrome (MERS) (2012–2020), the West-African Ebola virus epidemic (2013–2016), the Zika fever (2015–2016), and Avian influenza (2008–2014). None of these, however, achieved the spatial extent and the widespread impacts that the novel coronavirus has done (Cheval et al. 2020). The World Health Organization declared it a health emergency (Kroumpouzou et al. 2020, Sohrabi et al. 2020).

Kenya has not been spared the ravage of this disease (Karijo et al. 2020). The first case of COVID-19 in Kenya was confirmed on 13 March, 2020 (Macharia et al. 2020, Barasa 2020). Since then there were 68,193 laboratory confirmed swab tests and 1,228 deaths with positive test results as of 13 November, 2020 (Kajliwa 2020b). By March 2021 Kenya ministry of health announced a third wave of the COVID-19 outbreak that was totaling over 700 cases a day (Nakkazi 2021). A fear, of a fourth wave as a result of the highly contagious COVID-19 delta variant was reported by June 2021 (Herbling 2021). Currently as at August 17, 2021 there have been 222,894 total confirmed cases and 4,354 cumulative fatalities (RoK 2021). Kenya has the highest number of recorded cases of COVID-19 in East Africa and, despite various confinement measures, infection numbers are yet to be contained. Although there was a drop in cases in the month of September 2021, there has been a surge with positive cases going up to 14% from the second week of October 2020 (Kajliwa 2020a) moving into 2021 and in August 2021 stands at 12.5% (RoK 2021). There is sustained local transmission. The major concerns, according to Barasa (2020), are limited surge capacity of the country's health system and groups of Kenyan population identified as potentially highly vulnerable to infection and/or severe disease, such as the older people living in informal settlements.

Informal settlements are themselves highly susceptible to disease outbreaks. For example, disease outbreaks in the past pandemics have been accelerated in informal settlement settings: the spread of Ebola during the 2014-2016 pandemic was propelled by the densely populated informal settlements in Guinea, Liberia, and Sierra Leone; and Zika took hold in favelas in Rio de Janeiro, Brazil (Snyder et al. 2017, Snyder et al. 2014). The risk is magnified for older people in such environment by not only the poor living environment but also their advanced age that compromises their immune system and the fact that they are more likely to have pre-existing comorbidities such as heart disease, hypertension, diabetes, lung or kidney disease, which weaken their body's ability to fight infectious disease (Daoust 2020). To prevent this pandemic from having serious implications on such highly vulnerable groups, it is imperative to institute effective infection prevention and control measures. Consequently, it is urgent to understand their knowledge, perception, assessment of the risk, and adherence to prevention measures. In this study, we investigated participants from two informal settlements in Nairobi City.

## Materials and Methods

This study was a cross-sectional survey of respondents aged 60 years and above from two selected informal settlements in the city of Nairobi. Records of the older people aged 60 and above were obtained from the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) which showed that there were a total of 1829 older people aged 60 and above living in the two slums of Viwandani and Korogocho. From these records a random sample of 150 respondents was drawn to constitute study subjects, taking consideration of age group and sex.

The sample size was calculated based on Kothari's formulae for determining sample size for finite population (Kothari 2004) as illustrated below:

$$n = \frac{z^2 pqN}{e^2(N-1) + z^2 pq}$$

Where: n-is the sample size

N-is the population of older people in the two informal settlements (1829)

z-is value found in the table for the desired confidence level of 95% (1.96)

p-is the estimated proportion which has the attribute in question (sample proportion) (0.5)

q-is 1-p

e-is the precision rate or margin of error (8%)

$$n = \frac{1.96^2 \times (0.5) \times (0.5) \times (1829)}{(0.08)^2 (1829 - 1) + (1.96)^2 \times (0.5) \times (0.5)} \quad n = 138$$

The sample size was rounded to 150. Random sampling was used to pick respondents from the list obtained from the NUHDSS. Primary data were obtained using a questionnaire which was administered to each respondent by the researcher and research assistants. The questionnaire was used to gather information on the demographic characteristics of the respondents, their knowledge, attitudes and practices toward COVID-19. Health protocols such as wearing face masks, keeping social distance and sanitizing which are required to curb the spread of coronavirus were observed during the administration of the questionnaires. Data were analyzed using the Statistical Package for Social Science (SPSS) software which enabled to the generation of descriptive statistics such as frequencies and percentages.

## Results

A total of 150 older people respondents were included in the study. Most (63.3%) of the respondents were from Korogocho informal settlement. This is because it is the larger of the two. The majority (66.7%) of the respondents had resided in the informal settlements for over 20 years, with males being the most predominant group (61.3%). In terms of age, most (55.3%) were between the ages

of 60-69 years, with majority (44.7%) married; however, up to 30.7% were widowed. Most of the respondents had either attained primary level of education (44.0%) or had no formal education (40.0%). Up to 34.0% were unemployed with 28.0% involved only in small trade. Finally, 42.7% lived in households with 2 to 5 members, while 27.3% stayed alone (Table 1).

**Table 1. Demographic Characteristics of the Respondents**

Characteristics of Respondents	Male		Female		Overall	
	f	%	f	%	f	%
<b>Residence</b>						
Korogocho	50	54.3	45	77.6	95	63.3
Viwandani	42	45.7	13	22.4	55	36.7
<b>Length of residence (years)</b>						
1-9	9	9.8	4	6.9	13	8.7
10-14	8	8.7	4	6.9	12	8.0
15-19	17	18.5	8	13.8	25	16.7
20 and above	58	63.0	42	72.4	100	66.7
<b>Sex</b>						
Male	-	-	-	-	92	61.3
Female	-	-	-	-	58	38.7
<b>Age Category (years)</b>						
60-69	54	58.7	29	50.0	83	55.3
70-79	30	32.6	20	34.5	50	33.3
80 and above	8	8.7	9	15.5	17	11.4
<b>Marital Status</b>						
Married	55	59.8	12	20.7	67	44.7
Single	8	8.7	9	15.5	17	11.4
Divorced/Separated	8	8.7	12	20.7	20	13.3
Widowed (widows and widowers)	21	22.8	25	43.1	46	30.7
<b>Educational Attainment</b>						
No formal education	33	35.9	27	46.6	60	40.0
Primary	41	44.6	25	43.1	66	44.0
Secondary and above	18	19.6	6	10.3	24	16.0
<b>Main Occupation</b>						
Roadside farming	5	5.4	5	8.6	10	6.7
Small trader	20	21.7	22	37.9	42	28.0
Retired former government/private employee	10	10.9	0	0.0	10	6.7
Community/social worker, clergy	2	2.2	3	5.2	5	3.3
Artisan/Jua Kali	13	14.1	1	1.7	14	9.3
Unemployed	29	31.5	22	37.9	51	34.0
Casual/domestic worker, security personnel	13	14.1	5	8.5	18	12.0
<b>Size of household</b>						
Stay alone	30	32.6	11	19.0	41	27.3
2-5	38	41.3	26	44.8	64	42.7
6-10	19	20.7	14	24.1	33	22.0
11 and above	5	5.4	7	12.1	12	8.0

### Perception and Knowledge about COVID-19 by Older People

Over 99% (149 out 150) of older people living in informal settlements had

heard about COVID-19 (Table 2).

**Table 2. Heard of COVID-19**

Aware/heard about COVID-19	n	%
Yes	149	99.3
No	1	0.7
<b>Total</b>	<b>150</b>	<b>100.0</b>

The older people who indicated that they had heard of COVID-19 reported receiving information on COVID-19 from a wide variety of sources (Table 3). Overall, radio programmes or messages were the most widely cited sources (46.3%). These included radio programmes or shows (27.5%), and government through radio messages (18.8%). These were followed by neighbors (16.8%) and government through T.V. messages (15.4%). Exposure to radio was almost similar for all levels of education; however, neighbors were mainly relied on by those with non-formal education. This group relied less on T.V. programmes as compared to those with higher levels of education. Most male participants (55.5%) as compared to females (31.6%) got information about COVID-19 over the radio. In terms of age, neighbors and radio as sources of information ranked higher with increasing age.

**Table 3. Main Source of Information About COVID-19**

Main source of information	n	%
Neighbors	25	16.8
Friends	4	2.7
Spouse	2	1.3
Government through TV messages	23	15.4
Government through Radio messages	28	18.8
Government officials e.g. chief, community leader	4	2.7
TV through the programmes or shows	11	7.4
Radio through the programmes or shows	41	27.5
Community meeting	1	0.7
Church	7	4.7
Mobile SMS/Internet	1	0.7
Community health workers/volunteers	2	1.3
<b>Total</b>	<b>149</b>	<b>100.0</b>

The study participants had varied knowledge on the symptoms of COVID-19. For example, although knowledge of dry cough and fever which are the top two symptoms of COVID-19 were high at 70.5% and 67.8% respectively, difficulty in breathing was only mentioned by 31.5% of the respondents even though this is a sign of very severe infection (Table 4). Up to 33.6%, 30.2% and 19.5% reported blurred vision, sneezing and sweating respectively yet they are not symptoms of COVID-19. Knowledge of symptoms of COVID-19 increased with education. For example, 64.4% of those with no formal education listed dry cough, and this was slightly higher for those with primary level of education at 69.7% and rose to 87.5% for those with secondary level of education and above.

**Table 4.** Knowledge Regarding COVID-19 Symptoms

Knowledge about COVID-19 symptoms	n	%
Fever	101	67.8
Sneezing	45	30.2
Sweating	29	19.5
Dry cough	105	70.5
Fatigue	23	15.4
Headache	50	33.6
Blurred vision	8	5.4
Difficulty in breathing	47	31.5
Sore throat	9	6.0
Blocked stuffy nose	1	0.7
Running nose	5	3.4
Vomiting	6	4.0
Feeling of tiredness	15	10.1
Loss of taste	5	3.4
Don't know	2	2.0

Among the older people, knowledge on who is at risk of severely getting sick from COVID-19 varied. For example, 51.0% were able to identify the elderly as at risk of getting severely sick, while up to 61.1% incorrectly believed that everyone was at high risk of severely getting sick from COVID-19. Only 9.4%, 19.5% and 29.5% mentioned people with HIV, young children, and people who are already sick/weak immune system respectively, yet these are groups that have been categorized by health bodies to be at high risk (Table 5). Education had mixed effect on knowledge of the two high risk groups, that is, the elderly and people who are already sick/weak immune system. For example, while knowledge on people who are already sick/weak immune system increased with the level of education (e.g., 27.1% for non-formal, 30.3% for primary level and 33.3% for secondary level and above), that of elderly at high risk decreased with level of education (e.g., 55.9% for non-formal, 50.0% for primary level and 47.1% for secondary level and above). However, knowledge of these two high risk groups was higher among females (e.g., 40.4% and 61.4% respectively) compared to males (e.g., 22.8% and 44.6% respectively). The same trend was noticeable with age category where the results indicated that the knowledge of the two high risk groups was higher among those aged 70 years and above as compared to those below this age category.

**Table 5.** Knowledge of People at Greatest Risk of Getting Severely Sick from COVID-19

People at greatest risk of getting severely sick from COVID-19	n	%
Everyone	91	61.1
Young children	29	19.5
Elderly people	76	51.0
Young adults	2	1.3
Pregnant women	5	3.4
People with HIV	14	9.4
People who are already sick/weak immune system	44	29.5
People who are obese	3	2.0

The study also sought to know what the older people think about being at risk of contracting COVID-19. Overall, 60.4% believed that they are at risk, while 39.6% do not think they are at risk (Table 6).

**Table 6.** *Own Assessment of Being at Risk of Contracting COVID-19*

At risk	n	%
Yes	90	60.4
No	59	39.6
<b>Total</b>	<b>149</b>	<b>100.0</b>

The main reasons given by most of those who indicated that they were at risk of contracting COVID-19 included age (50.0%) and underlying health conditions (40.0%). While those who believed that they were not at risk of contracting COVID-19 indicated mostly that it is because of their strong religious belief (35.6%) and because COVID-19 cases in Kenya might not actually be true (32.2%). The reasons for being at risk of contracting COVID-19 are summarized in Table 7.

**Table 7.** *Reasons for Being at Risk of Contracting COVID-19*

Reasons	n	%
<b>Reasons they believe they are at risk (n=90)</b>		
Because of my age	45	50.0
Because of my underlying health conditions	36	40.0
Because everybody is at risk	20	22.2
Because of my living (housing) condition	11	12.2
Because I know people who have contracted the virus	1	1.1
Because I have information about how the virus spreads	25	27.8
Because people where I live do not observe the health protocols against the spread of the virus	18	20.0
Because I don't know how to protect myself against the virus	2	2.2
Because I can't stop relatives/friends/neighbors from visiting me	4	4.4
Because I can't afford the protective measures required against the spread of the virus	9	10.0
I can't remain indoors because I have to go out in order to earn a living and buy food	12	13.3
Others (specify)	4	4.4
<b>Reasons they believe they are not at risk (n=59)</b>		
Because I am healthy	12	20.3
Because coronavirus is the disease for the rich	9	15.3
Because it is a white man's disease	5	8.5
It affects other people not known to me	1	1.7
Because of my strong religious belief	21	35.6
Because I am immuned to it	6	10.2
Because it does not affect people of my age	1	1.7
COVID-19 (coronavirus) cases in Kenya might not actually be true cases but meant to attract funding	19	32.2
Because I stay indoors all the time and take all precautions	13	22.2
Others (specify) e.g., there are a lot of myths around COVID-19	5	8.5

The main fears reported by the older people about COVID-19 according to the results presented in Table 8 are that COVID-19 is a virus that may result in death (40.9%), and that there is no cure or treatment (20.8%). The least reported fears were being afraid of infecting others (1.3%), loved one may get ill (2.0%),

and that many people under-estimate the disease (3.4%). Fear of death was slightly higher among those aged 70 to 79 years (42.0%) compared to those aged 80 and above (37.5%) and those aged 60 to 69 (41.0%). In terms sex, more males (41.3%) than females (40.4%) feared death.

**Table 8.** Main Fear Regarding COVID-19

Main fear	n	%
Death/virus kills people	61	40.9
No cure or treatment	31	20.8
Loss of income	10	6.7
Food shortage	12	8.1
I may infect others	2	1.3
Many people under-estimate the disease	5	3.4
Loved one may get ill	3	2.0
It may infect too many people and turn uncontrollable	6	4.0
People losing their jobs and livelihood	8	5.4
Getting quarantined	6	4.0
Others (specify)	3	2.0
I have nothing to fear	2	1.3
<b>Total</b>	<b>149</b>	<b>100.0</b>

Asked about the behavior they have adopted in response to COVID-19 pandemic, the majority of the study participants reported that they mainly wear face masks when outdoors (73.2%) and wash their hands more frequently using soap (69.8%) as away to avoid contracting COVID-19. But less than 50% stopped attending social gathering, keeps distance, stays indoors, and avoids greeting with hands (Table 9). Overall, men and those with higher education wore face masks and washed their hands frequently. However, this was reversed considering age where the lower age categories had adopted more of the response behavior than the older ones.

**Table 9.** Behavior Adopted in Response to COVID-19 Pandemic

Behavior	n	%
Staying indoors	40	26.8
Stopped attending social gathering	55	36.9
Keep distance of at least 1.5m while in public places	55	36.9
Inform people of illness symptoms	4	2.7
Wash hands using soap frequently	104	69.8
Use hand sanitizer frequently	33	22.1
Always wear face mask when outdoors	109	73.2
Stop greeting people by hand	35	23.5
Sneeze on a closed elbow	5	3.4
Others (specify)	6	4.0
Do nothing	2	1.3

In response to what they would do if they developed symptoms similar to those of COVID-19, most study participants indicated that would go to clinic (79.2%). Only 20.1% noted that they would call the government toll free hotline number, and less than 15% reported that they would keep distance, go for test, stop attending social gatherings or stay indoors (Table 10). Men were less likely



(12.0%) to go for test as compared to women (15.8%). Similarly, those with less education (10.2% non-formal and 12.1% primary level) were less likely to go for test. In terms of age, the percentage of those who would go for test were higher among those aged 60 to 69 years, decreasing to 14.0% for those aged 70 to 79 years and none among those aged 80 years and above.

**Table 10.** Behavior adopted if you had Symptoms Similar to Those of COVID-19

Behavior	n	%
Go to clinic	118	79.2
Staying indoors at home more	16	10.7
Call toll free number	30	20.1
Inform neighbors	6	4.0
Inform friends	6	4.0
Inform spouse	6	4.0
Go for test	20	13.4
Keep distance	22	14.8
Stop attending social gatherings	17	11.4
Informs people of illness symptoms	7	4.7
Others e.g. buy medicine to manage symptoms	3	2.0
Do nothing	1	0.7

## Discussion

Evidence has shown that older people are the most vulnerable population group to COVID-19 pandemic (Daoust 2020). This situation is accentuated for those living in informal settlements in developing countries like Kenya, because living and sanitation conditions in these areas are poor, coupled with high population density, small dwelling and very low income among residents. They are, therefore, the most poorly equipped for the COVID-19 and the most at risk for transmission (Austrian et al. 2020). Consequently, attitude towards COVID-19 and compliance toward preventive measures among older people living in informal settlements will have a greater effect of minimizing the spread and its attendant severe illness and death among this very highly vulnerable group. To facilitate a mechanism through which the government can engage this group in COVID-19 response we conducted a survey to provide information on the level of their knowledge, perception, and assessment of the risk of COVID-19, and adherence to prevention measures. The study showed that almost all study participants had heard or were aware of COVID-19 pandemic. This means that the daily updates from public health agencies in Kenya, and government efforts to enforce measures to curb the spread of the disease have ensured that even older people living in informal settlements get to know about the existence of the disease (Hagger et al. 2020). The most important source of information about COVID-19 for the older people living in the informal settlement was radio. This is in contrast with studies targeting the general population (Hager et al. 2020) or the youth (Karijo et al. 2020) that have shown that the social media (internet) and TV were the main sources of information about COVID-19. This could be attributed to the fact that older people are less likely to use mobile phone or internet technology because

they are late adapters to technology. Furthermore, T.V. ownership among residents of informal settlements and especially older people is low. This, therefore, means that to effectively reach the older people living in informal settlements with messages on COVID-19 pandemic, response teams should prioritize the use of radio.

The study revealed that most participants were able to identify two important symptoms of COVID-19, but few accurately identified difficulty in breathing, a key symptom which signifies critical illness and potential need for hospitalization (Austrian *et al.*, 2020). For the older people, not being able to correctly identify this symptom can be fatal in a short time. Overall, response teams need to develop communication strategies that can better educate the older people on the key symptoms of COVID-19 in order to increase their knowledge and empower them to seek help from health facilities when they notice these symptoms.

Slightly over 50% of the participants correctly identified the elderly as those at greatest risks of getting severely sick from COVID-19, and fewer (less than 30%) listed those with compromised immune system. Emphasizing that this group is at very high risk can help the older people and the people around them better prioritize and take steps to protect this group. About 60% of the participants felt that they were at high risk of infection. However, this leaves out about 40% of this highly vulnerable group with a false feeling that they are safe at a time when second wave in COVID-19 infection and deaths is being experienced in Kenya (Sanga 2020). Although the perception of being at risk to COVID-19 among the study participants was higher than those recorded in a previous study (35%) carried out by Austrian *et al.* (2020) among general adult population in informal settlement in Kenya at the end of March 2020, there is indication that several months after the first case of COVID-19 was reported in Kenya, risk perception among vulnerable population groups like older people has not reached the desired level, and, therefore, should be of concern. Such a scenario requires concerted effort by health and other government officials to sensitize the older people being a high risk group. The apathy which is the result of the perception that they are not at risk, according to the finding of this study, arose from the fact that the study participants felt that they had strong religious belief, so God would protect them, and also the false but commonly spread rumour among a section of Kenyan population that the government is using COVID-19 positivity figures to attract funding from donors. A previous study by Karijo *et al.* (2020) in April 2020 among the Kenyan youth had revealed similar myth on the belief about God's protection from the risk of contracting COVID-19. Such myths and misconceptions are a threat to curbing the transmission of COVID-19 pandemic and a great danger to a vulnerable group like the older people living in informal settlements. This calls for strengthening messaging to eliminate them.

Most participants expressed concern about death from COVID-19. This was higher among those who had not reached 80 years. Loss of income that had been reported as a major concern in a previous study in informal settlement in Kenya (Austrian *et al.* 2020) was reported by few older people in the current study. This could be attributed to the fact that unlike the other sections of the society older people rely on government cash transfers, relatives and well-wishers. Therefore,

direct effect on income is not pronounced. Government actions need to sustain and even increase cash transfers to older people in order to reduce the risk of older people exposing themselves to the virus when they go out to seek employment or other income generating activities.

Many participants indicated that the main steps they have adopted to avoid contracting COVID-19 were wearing face masks and frequently washing hands using soap. However, many were not taking steps like avoiding social gatherings, keeping distance and staying at home. Yet these are some of the recommended behavior to avoid contracting the disease. These precautionary measures are key in reducing the spread of the virus in already densely populated informal settlements, and to high risk groups like older people. It is critical that the government messaging regarding steps to be taken to avoid contracting COVID-19 should be packaged to target specific groups like older people. Over three quarters of study participants indicated that they would go to clinic if they developed symptoms similar to those of COVID-19. But of concern is that only a few would go for test, keep distance or stop attending social gathering. Meaning they would transmit the virus to others. The finding that most informal settlements residents in Kenya would go to clinic if they developed symptoms are similar to those of Austrian et al. (2020). Meaning that World Health Organization's (WHO) guidance on staying at home and calling a health provider if symptomatic to avoid overcrowding health facilities has not been understood well by most people living in informal settlements.

## **Conclusion**

Our study revealed that although almost all older people living in informal settlements in Nairobi city have heard about COVID-19, knowledge on symptoms, risk and preventive measures are not that high. There is, therefore, need for well-tailored and contextualized awareness campaigns to reach this high risk group. Strategies to ensure older people adopt and sustain appropriate preventive measures will be critical in reducing the impacts of the virus on older people living in informal settlements.

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