

## **Gap between Expectation and Convenience of Open Access Public Toilets in Dhaka: A Cross Sectional Investigation**

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### **ABSTRACT**

The aim of this study was to explore the extent of availability of open access public toilets in Dhaka and to find out the reasons behind avoiding use of it. The is a cross-sectional study in Dhaka city undertaken between February to May 2016. Data was collected from 384 respondents who live or visit regularly for work in Dhaka. Semi-structured questionnaire was used in data collection through face-to-face interviews. The availability of open access public toilets found strongly associated with the extent of urinate/defecating in open places ( $p<0.001$ ), Urinary/anal infection history ( $p<0.001$ ) and opinion of the respondents about relationship between disease and present public toilet situation of the city ( $p<0.001$ ). While more than 81 percent people replied ‘no/don’t know’ when asked about availability of public toilets near their working places. Male respondents are almost 0.4 times more likely to visit open access public toilets ( $p<0.001$ ) than females. Around 60 percent of the respondents share dissatisfaction with the cleanliness and over 70 percent with the indoor environment, both are strongly significant ( $p<0.001$ ) as the main reasons for avoiding open access public toilets. Avoiding open access public toilets is also significantly related to poor water supply system ( $p<0.001$ ), soap availability ( $p<0.002$ ), tissue availability ( $p<0.001$ ) and feeling troubled with room structure ( $p<0.001$ ) of last visited public toilet. Unhygienic and uncomfortable environment are common features of almost all the public toilets in the city but the situation is clearly ignored by the authorities. The research suggests that almost all the people notify the demand for new and much more public toilets into the city so that they can have access when they are necessity.

### **Keywords:**

Dhaka, open access, public toilet, urban sanitation

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## 1.0 INTRODUCTION

Dhaka, the capital city of Bangladesh has one of the highest population growth in the world. Along with more than 6.97 million people (BBS, 2011) **Error! Reference source not found.** its current growth rate is over three per cent and bears the merit of being the fastest developing city in the world. It accommodates more than one-third of the total urban population and about nine per cent of the total population of the country in an area of 797 sq. km. with an extremely high population density of 27,700 people living per square kilometer (BBS, 2011). Although, the average income is high in Dhaka rather than other parts of the country, many people remain poor. An estimate suggests that the poverty headcount rate was around 32 Percent in 2006. (Salma and Mehedi, 2011) Additionally, nearly half a million migrants flow into Dhaka each year to try to make a living in the city due to various push and pull factors and predictions show that by 2025, Dhaka will be home to more than 20 million people larger than Mexico City, Beijing or Shanghai (Khairul, 2014).

Nearly one-third residents in Dhaka live in slums houses and most of the new migrants choose slums firstly to live in every year. Moreover, about one million people living in the city do not have a place to live in (SACOSAN-V, 2013). They are a floating population living in stations, parks, market places, etc. With this massive increase in population (which already poses challenges of overcrowding, pollution, poverty and overtaxing services), lack of planned development, the situation has already become worse. However, an estimate conducted in 2001 shows that about one-third of the total population of Dhaka do not have access to any sanitation facilities (Salma and Mehedi, 2011). They defecate either in roadside drains or other open places. Since there have not been any recent, major development projects, it is likely that this situation has worsened by now. On the other hand, a general assumption shows that at any time point during the day, about two to three million people stay on the streets for managing their livelihoods and other daily necessities. An estimate shows that the number of rickshaws in Dhaka Metropolitan City in 2000 was about 280,000 and it is very likely that this number has doubled in 10 years (ICDDR, B 2014). Even the total number of people involved in rickshaw pulling alone is about one million who spend on an average, more than five hours a day on the streets (ICDDR, B 2014). In addition, according to different newspaper sources, more than one million people travel to Dhaka City every morning from the neighboring areas too.

The nearly two hundred and fifty open access public toilets are existing in Dhaka city, care not much for women nor for sanitary conditions (Salma and Mehedi, 2011). In a city where over fifty lakh people are without proper toilet facilities, about two hundred and fifty open access public toilets will remain for them an unreachable luxury. Open areas such as parks, pavements, waterside, and any quiet area remain their points of relief and sources of mal-hygiene for the city. The other fortunate half of the populace, those who have toilets in their homes and offices, also require facilities in public places whilst shopping, working and running errands, but such conveniences are hard to get hold of, and uncertain. UN-Water chairman Pasquale Steduto said at 2008 that, ‘The focus on sanitation is fundamental to human beings. The MDG target on sanitation is seriously lagging schedule. The entire UN System has a shared responsibility in mobilizing concrete actions towards its achievement; investments must increase immediately’ (WHO and UNICEF, 2008; Nelson et al., 2014)).

Child and gender friendly public toilets that offer private and separate toilets for boys and girls, as well as facilities for hand washing with soap, are better equipped to attract and retain all, especially women. Where such facilities are not available, Women often cancel their outdoor work during menstruation. Also, girls are often withdrawn from school when they reach puberty due to absence of proper toilet facilities. Therefore, this study wants to address following two facts about open access public toilets in Dhaka, these are: the extent of availability and the reasons behind avoiding use of it so that the extent of the problem can be addressed and eventual policy making to improve the quality of life.

## **2.0 METHODOLOGY**

### **2.1 Study Origin and Design**

This Cross-Sectional study was conducted in between February 2016 to May 2016. The study area included eighteen cluster or busy zones form both the South (DSCC) and north (DNCC) city corporations in Dhaka city. Each of these zones contains two busy spots. Generally, people of busy areas need public toilets more than others. These cluster areas were selected for the study as these are the busiest and most eventful areas of the city. During survey interview, informal discussions were conducted with respondents which dealt with respondent's experiences regarding deficiencies in the current provisions and expectations about good quality, and inclusive healthy public toilets at the future.

### **2.2 Target Respondents and Sampling Procedure:**

Respondents of the study were citizens living in Dhaka and those that visited Dhaka regularly (from the cluster areas). The selected areas were the important transportation, business and administrative areas of the city. These areas were in both the south and north city corporation of Dhaka. However, while every selected zone contains public toilets, either Government or private owned, most of these areas lack public toilet facilities and people were often sighted urinating at open places. Before the main survey, a quick field visit to the selected study areas gave an idea about the concentration of public toilet users and their characteristics. This also helped to determine how to approach the ultimate study sample. Our target respondents were mainly the Government and Private Service Holders, University Students, Wage laborers (Construction, Hotel and Transport workers, Street Vendors etc) and Unemployed citizens (Retired, Housewife, and Disabled etc. of 18 years or above. Sample Size was estimated by the random sampling formula of Necessary Sample Size  $(S) = z^2 \times SD \times (1-SD) \div C^2$ . There were 18 Clusters/Busy zones; 20 respondents from each  $(18 \times 20 = 360)$ ; with 6 other public toilets and related spot and 4 samples from each of those spots  $(6 \times 4 = 24)$  were selected to collect data. Finally,  $360 + 24 = 384$  respondents from different 42 spots were included in the study.

### **2.3 Data Collection and Analysis**

Semi-structured questionnaires were used to collect data on socio-demographic factors and collective data on the feasibility of open access public toilets in the city of the users. The questionnaires were administered through face-to-face interviews. The interviews were conducted in the local native language (Bengali). The interview questionnaire was pre-tested and revised before actual data collection to ensure quality. The questionnaire items included respondent's socio-demographic factors, Level of Demand related factors and Present feasibility related factors. Collected data was regularly checked by the field supervisor and the principal investigator to ensure quality and completeness of the questionnaires. The Software Package for Social Sciences (SPSS) was used in the analysis of collected data. All factors that significantly related to the level of demand and feasibility of open access public toilets at bivariate analysis were included in the linear regression model at multivariate analysis (an alpha level  $< 0.05$  was used to determine statistical significance).

## **3.0 FINDINGS**

A total of 384 samples were studied, of them 222 were male participants and 162 were female. They were selected from those living in the city and those who were passing the respective zones almost every day for their regular work or job. Socio-economic and demographic characteristics of the respondents showed that the mean ( $\pm$ SD) age was 34.7 ( $\pm$ 13.9) years. Around 31 percent of the respondents had higher secondary education and among others almost an equal percentage shared below primary education level. In between primary to secondary level including 15 percent of respondents with education level of bachelor to above. Wage laborers such as, street vendor/business, transport workers, hotel workers, construction workers etc. were the largest

(45.1%) portion of respondents followed by University students, the unemployed and government or private service holders. A maximum of 41.1 percent of respondents' income was between 5,000 to 9,999 BDT, with the median of 12,000 BDT.

Findings about managing the needs of toilets or washrooms during outside of home revealed that, almost 70 percent of them use Mosque/Office/Nearest restricted toilets. 16 percent of respondents used toilets in markets/shopping centers. Alongside 14.6 percent of them are used to holding their urine/excreta pressure or urinate/defecate at open places. This data frequently matched with their last type of public toilet visited. Around 47 percent of respondents stated that their last visited public toilet was at Mosque/office/nearest restricted toilets. 30 percent of them visited toilets in markets/shopping centers. 22.7 percent of them used open access mobile/temporary public toilets, among them a few respondents stated that the last public toilet that they had visited was Open access DCC public toilet. To find out the level of availability and the impact of the unavailability of public toilets a chi-square analysis was conducted to investigate the association. A significant association found with gender ( $p < 0.001$ ), age group ( $p < 0.001$ ) and education level ( $p < 0.001$ ). Availability of open access public toilets near working place also found associated significantly with extent of urinating/defecating at open places ( $p < 0.001$ ).

After being asked, approximately 95 percent significantly ( $p < 0.03$ ) responded that there is a need for new and more public toilets in the city. On the question of necessity though 05 percent participants felt that they don't need any public toilets in their job/working areas. Not surprisingly more than 98 percent people thought that the existing number of public toilets is not sufficient. Relatively more than half of the respondents therefore voted to increase more than five times than the existing number of public toilets while suggestions for five times and four times to increase the number with 27.6 percent and 21.9 percent sequentially.

**Table-1: Associations with the extent of availability of public toilet near work places**

Variables	Availability of public toilets near work places			p-value
	Yes (%)	Absent/Don't know (%)	Total (%)	
<b>Overall</b>	<b>18.5</b>	<b>81.5</b>	<b>100</b>	
Gender				
Male	14.6	43.2	57.8	<b>0.001</b>
Female	3.9	38.3	43.2	
Age Group				
Less than 30	12.5	32.2	44.7	
30 to 49	5.2	29.7	34.9	<b>&lt;0.001</b>
50 to above	0.8	19.5	20.3	
Education level				
Below than primary	5.7	20.0	25.7	
Primary to secondary	5.2	21.1	26.3	<b>0.001</b>
Higher secondary	7.3	23.7	31.0	
Bachelor to above	0.3	16.7	17.0	
Occupation				
Government/Private Service	3.6	16.7	20.3	
Wage laborer	7.5	37.5	45.0	0.626
University Student/Unemployed	7.4	27.3	34.7	
Managing toilet needs outside of home				
DCC public toilet/Toilet in market	3.4	12.8	16.2	
Mosque/Nearest restricted toilet	13.3	55.9	69.2	0.434
Urinate/defecate at open places	1.8	12.8	14.6	
Extent of visiting open access public toilet				
Rarely	9.3	46.4	55.7	0.315

Very few	9.1	35.2	44.3	
Extent of urinating/ defecating at open places				
Never Do	6.0	37.8	43.8	
Rarely	3.9	26.8	30.7	<b>&lt;0.001</b>
More than twice in a week	8.6	16.9	25.5	
Feel any necessity for open access public toilets				
Yes	71	293	94.8	<b>&lt;0.03</b>
No	0	20	5.20	
Sufficiency of the existing number of open access public toilets				
Sufficient	0	7	1.82	0.203
Not Sufficient	71	306	98.2	
Demand than existing number				
4 times	20	64	21.8	
5 times	23	83	27.6	0.110
More than 5 times	28	166	50.6	

To investigate the main reason behind avoiding using open access public toilets, a chi-square analysis was employed. It found a significant association with gender ( $p < 0.01$ ) and occupation ( $p < 0.001$ ). Around 60 percent of the respondents shared their dissatisfaction on the cleanliness and over 70 percent for the environment. Both are significant ( $p < 0.001$ ) as being the main reason for avoiding open access public toilets. While satisfied, respondents responded only 17.7 percent for cleanliness and 29.2 percent for indoor atmosphere. 24 percent of the participants agreed that existing open access public toilets are very dirty places and half of them added that the indoor atmosphere also same. Avoiding open access public toilets was also significantly related with a poor water supply system ( $p < 0.001$ ), soap availability ( $p < 0.002$ ), tissue availability ( $p < 0.001$ ) and feeling uncomfortable in the layout of the toilet. ( $p < 0.001$ ).

**Table 2: Associations with reasons behind avoiding open access public toilets**

Variables	Reasons behind avoiding public toilets				p-value
	Unhygienic	Environment	Dissatisfactory service	Total	
<b>Overall</b>	<b>48.7</b>	<b>21.9</b>	<b>29.4</b>	<b>100</b>	
Gender					
Male	31.8	12.0	14.1	58.8	<b>0.010</b>
Female	16.9	1.0	15.4	42.2	
Occupation					
Government/Private Service	13.8	4.9	1.5	20.2	
Wage laborer	13.8	10.2	21.1	45.1	<b>&lt;0.001</b>
University Student/Unemployed	8.1	6.7	6.8	21.6	
Cleanliness of the public toilets					
Satisfactory	1.6	3.6	12.5	17.7	
Not Satisfactory	31.8	13.0	13.5	58.3	<b>&lt;0.001</b>
Very Dirty	15.4	5.2	3.3	24.0	
Indoor Atmosphere at last visit					
Satisfactory	8.3	6.8	14.1	29.2	<b>&lt;0.001</b>
Not Satisfactory	40.3	15.1	15.4	70.8	
Water supply at last visit					
Good	26.3	8.5	19.5	54.4	<b>0.001</b>
Collected water Jar	22.4	13.3	9.9	45.6	

Soap availability at last visit					
Yes	15.9	5.7	14.3	35.9	<b>0.002</b>
No	32.8	16.1	15.1	64.1	
Tissue availability at last visit					
Yes	3.3	0.8	4.6	8.9	<b>&lt;0.001</b>
No	45.3	21.9	24.1	91.1	
Feels uncomfortable for indoor structure					
Yes	20.6	13.3	4.9	38.8	<b>&lt;0.001</b>
No	28.1	8.6	24.5	61.2	
Responsible for present condition					
Government authority/DCC	26.6	20.3	17.2	65.6	<b>&lt;0.001</b>
Leaseholders/Service providers	20.6	0.2	12.2	34.4	

Respondents of the study gave mixed responses in the consistency of holding urine/excreta pressure. 22.4 percent of them hold their urine/excreta pressure almost every day, while 37.5 percent hold sometimes, just 26 percent hold rarely and others were hold their pressure once/twice or more than twice in a week. Among the respondents who reported holding urine/excreta pressure, most of them marked their duration of holding urine/excreta pressure as not more than one hour. Around 65 percent of them hold pressure in between 30 minutes and about 35 percent of respondents hold pressure usually between thirty minutes to one hour. Almost 40 percent of participants do not wait to urinate/defecate at open places in case of unavailability of any type of public toilet, although about 69 percent of total respondents had familiarity with promotional activities to prevent open urinating/defecating. 31.2 percent could not remember or had no awareness knowledge about the prevention of open urinating/defecating at open places.

To prioritize the main reasons for avoiding open access public toilets, respondents mostly referred to the point of hygiene. Half of them replied that their reason for avoiding open access public toilets was due to unhygienic conditions. Another 21.9 percent of respondents expressed their uneasiness with the environment around and 29.4 percent mentioned that they were not satisfied with the services and/or do not want to pay money for using open access public toilets. Respondents who expressed their unwillingness to pay money, also added some reasons to explain why. Such other reasons included being situated far from the job/working places and dissatisfaction with the public toilet services. A small percentage said that the open access public toilets are not safe or felt insecure to visit there.

**Table-3: Logistic Regression analysis with the extent of visiting open access public toilets of respondents as dependent variable**

Variables	Coefficient (β)	p – value	Odds Ratio	95% CI for Exp. (β)	
				Lower	Upper
Gender					
Male	-0.951	<b>&lt;0.001</b>	0.386	0.237	0.629
Female					
Occupation					
Cleanliness of the public toilets	-0.409	<b>0.012</b>	0.664	0.482	0.915
Indoor Environment at last visit	0.140	0.522	1.150	0.750	1.764
Satisfactory					
Not Satisfactory	-0.744	<b>0.012</b>	0.475	0.266	0.850
Feels trouble with room structure					
Yes	1.423	<b>&lt;0.001</b>	4.149	2.492	6.909
No					
Reasons behind avoiding open access public toilets	-0.016	0.827	0.984	0.851	1.138

Responsible for present condition	-0.087	0.467	0.917	0.725	1.159
<b>Constant</b>	2.418	0.042	11.223		

Logistic regression analysis considering the extent of visiting open access public toilets of respondents as dependent variable and gender, occupation, cleanliness, room atmosphere and feeling trouble with room structure, reason for avoiding public toilets and opinion about responsible for present condition as independent variables. The table estimates that male respondents are almost 0.4 times more likely to visit open access public toilets ( $p < 0.001$ ) than females. Occupation is also significantly associated with the extent of visiting open access public toilets. It also shows that, opinion about indoor environment of last visited public toilet defer by almost 0.5 times for not satisfactory than satisfactory ( $p < 0.05$ ). Also, whom are visit open access public toilets rarely, they are around 2.5 times more uncomfortable with indoor structures ( $p < 0.001$ ).

#### 4.0 DISCUSSION

In Bangladesh, urinating/ and defecating in open places is not very common. However, in Dhaka city urinating in open places by men is quite a common practice. This does not happen only because of habit or illiteracy; it is practically difficulty to access a public toilet. Most of the toilets were established by Dhaka City Corporation (DCC) more than twenty years ago with a very limited feature of services. The total number of existing public toilets in working condition in the city is around 5,000 (including DCC authorized and non-governmental open access public toilets) but for almost 6.97 million (BBS, 2011) people of the city those are surprising in number and about 480 open access public toilets made this issue harder (Salma and Mehedi, 2011). A research project named “Transparent Chennai” in India revealed that, there are only 714 public toilets in the city of Chennai, for a population of 46.81 lakhs (Transparent Chennai, 2011). Another study in Nairobi of the Water and Sanitation Program published that Most of Nairobi’s 138 public toilets were built during the colonial era or soon afterwards. They are now owned by the Nairobi City Council (NCC), but for a variety of reasons they have received little maintenance or management attention for the last 20 years and many are in a very unhygienic, barely functioning state (WSP, 2004).

The availability of public toilets within the city is less than the amount needed. Several significant associations with availability of open access public toilet was found in this study, such as extent of urinate/defecating at open places ( $p < 0.001$ ), Urinary or anal infection history ( $p < 0.001$ ) and about relationship between disease and present public toilet situation of the city found significant association ( $p < 0.001$ ). While more than 81 percent people replied, absent or don’t know when asked about availability of public toilets near their place of work. It affects regular city life as other different studies revealed that, Toilet limitations significantly restrict people’s mobility in cities and their ability to take part in public life. “Ensuring public toilet provision is available to everyone can be considered essential to removing a serious barrier to wider participation in public life” (Knight and Bichard, 2011). A recent Survey of public toilets among the residents, workers and visitors in Cambridge suggested that, about 29% respondents stated that they were very likely and 35% respondents somewhat likely to use a public toilet nearby a city building, if they were in a commercial square. A maximum of 79% of respondents felt the greatest need for public toilets is near main city square ‘Harvard’ and about 40% of respondents also seek public toilets near different parks.

To explore the level of demand among respondents found significant association between extent of availability of open access public toilets and respondents’ opinion regarding Extent of urinating/ defecating at open places ( $< 0.001$ ). Around 95 percent respondents responded that there is a need for more and new public toilets near their place of work and it also significantly associated with the extent of availability ( $< 0.03$ ). "Sanitation is a cornerstone of public health. Improved sanitation contributes enormously to human health and well-being, especially for girls and women. We know that simple, achievable interventions can reduce the risk of contracting diarrheal disease by a third." said WHO Director-General Dr. Margaret Chan. (WHO and UNICEF, 2008) and Ann

M. Veneman, Executive Director of UNICEF said, “The absence of adequate sanitation has a serious impact on health and social development, especially for children. Investments in improving sanitation will accelerate progress towards the Millennium Development Goals and save lives” (WHO and UNICEF, 2008; Bhardwaj et al., 2013; Jeratagi et al., 2017).

Cleanliness and indoor atmosphere of the open access public toilets, are both significant ( $p < 0.001$ ) as reasons for avoiding open access public toilets. Avoiding open access public toilets also related with poor water supply system, soap availability, tissue availability and feeling trouble with indoor structure of last visited open access public toilets. About 24 percent of the participants agreed that existing open access public toilets are very dirty places and over 70 percent respondents expressed dissatisfaction at the atmosphere. A Toilet survey study in 2011 in Singapore (RAS, 2011) signified that, most of the respondents felt that the rating of toilets should be made compulsory. About half were very unhappy or unhappy with users’ efforts while most remained neutral about owner’s efforts and government intervention. The respondents of that study were happiest about the effort of cleaners and about half felt that users are most responsible for keeping the toilets happy followed by owners and cleaners. Regarding the need for improvement, respondents ranked toilet cleanliness first followed by its maintenance and design and they also felt that toilets remained dirty mainly because of irresponsible users. “Evidence indicates that inclusively and well-designed neighborhood outdoor spaces positively contribute to people’s health and quality of life” (Aspinall 2010; Yimam et al., 2014).

It was also observed that there were some mismanagement functions of public toilets, mostly in the places of excessive gathering. Male respondents are almost 0.4 times more likely to visit open access public toilets ( $p < 0.001$ ) than females. Along with mismanagement an insecure environment is also common in public toilets of Dhaka city. Security for Women and Children (when guardian visits the public toilet) can rarely be seen and among the surveyed public toilets about half of those have no “Women Section”.

## 5.0 CONCLUSION

The Study findings show that about most of respondents have knowledge about sanitation and demerits of urinating/defecating at open places. But also, the male respondents are used to urinating in open places. This is one of the main reasons for air pollution in the city and near about half of the respondents feel sick due to diarrheal disease in last six months. Due to non-maintenance, after long time use of open access public toilet in unhygienic condition, bacteria make their homes in toilet and hard-pressed to get sick. There is a crying need for more public toilets for a populous city like Dhaka. The research suggests that almost all the people notify the demand for new and much more public toilets into the city. They also share their experiences about inaccessibility and necessities of public toilets. Unhygienic and uncomfortable environment are common features of almost all the public toilets in the city but the situation is clearly ignored by the authorities.

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