

SECONDARY ANALYSIS
OF MICS PUNJAB 2014
TO MAP INEQUITIES IN

WATER, SANITATION & HYGIENE SECTOR

NOVEMBER 2016



Foreword

Housing & Urban Development, Public Health Engineering Department, Government of Punjab, is pleased to present this report on the secondary analysis of data on water and sanitation in the Multiple Indicator Cluster Survey (MICS) 2014 of Punjab.

There are various national and provincial level surveys conducted or facilitated by the Punjab Bureau of Statistics. One of the key surveys is the MICS recently conducted in 2014. Different research studies around the world and equity mapping done by PHED for MICS 2011 indicated that there was a wide divide between rural and urban groups as well as between rich and poor groups with regards to access and coverage of water and sanitation services. The MICS analysis further established the extent of existing coverage between rural and urban groups up to the district level followed by inequities in the context of income/poverty. This was vital information from the perspective of government commitment to work in the poverty reduction areas.

One of the key impediments to progress in water and sanitation is the rate of open defecation i.e. that proportion of the population that does not have access to safe sanitation facilities or latrines. The prevalence of open defecation is one of the international benchmarks of development and the new Sustainable Development Goal on water and sanitation has a specific target to eliminate open defecation. While the overall rate of open defecation in Pakistan has reduced to 13%, the rate for Punjab predominantly the rural areas remains high and therefore skews the national prevalence.

The Government of Punjab has taken major strides to reduce open defecation as well as enhance improved sanitation in the province. This is evident from the recent national and provincial surveys, which demonstrate a downward trend towards declining levels of open defecation in the province.

The secondary analysis of MICS Punjab 2014 together with PHED water quality data has helped establish a baseline on water and sanitation for each district in Punjab. Further, the in depth analysis also provides information about the association of mother education with sanitation and hygiene behaviours.

It is hoped that this report will serve a useful purpose for both improved planning and resource allocation in the sector and sub-sectors.

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Background

Punjab is the most populous province of Pakistan with approximately 101.391 million population in 2015. Rapid urbanisation and a growing population will continue to increase demands for sector and sub sector services, as the current share of urban population is 31.3%.

As per the Punjab Multiple Indicator Cluster Survey (MICS) 2014, about 94% of the population have an access to improved source of drinking water – 89% in urban areas and 97% in rural. Further, 19.2% population of Punjab province has access to tap water followed by 41.7% motorised pump and 30.6% hand pumps. The proportion of population having access to tap water as a main supply of drinking water is higher in urban areas, 39.2% as compared to only 9.6% in rural areas. Figure 1 highlights overall distribution of improved water source to HHs in the province.

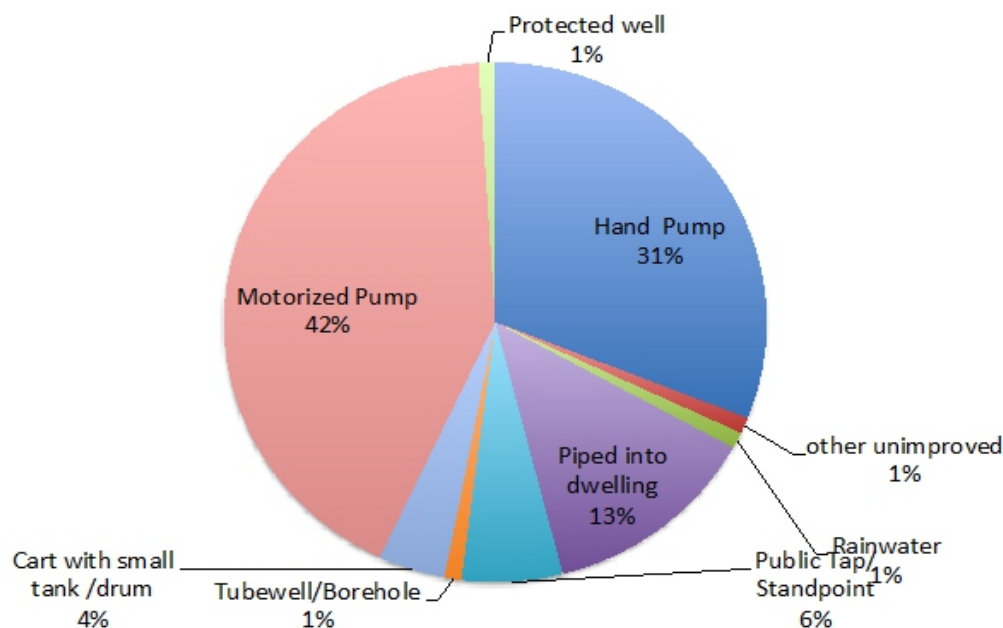


Figure 1: Per cent Distribution of Household source of Drinking Water

As per Punjab MICS 2014, 75% of the population are living in households who use improved sanitation facilities, which is higher in urban (92%) as compared to rural areas (67%). Figure 2 is overall distribution of sanitation facilities in the province.

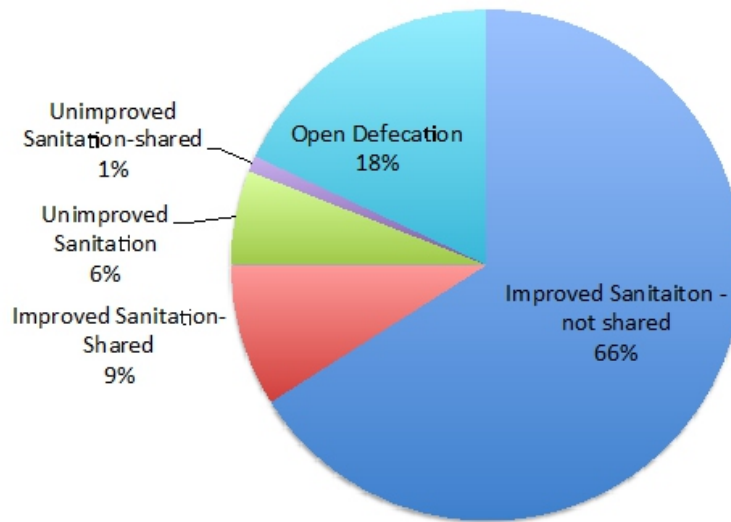


Figure 2 Per cent Distribution of Household by use of Sanitation Facilities

The Housing, Urban Development & Public Health Engineering Department (HUD&PHED), Government of Punjab has the mandate to enhance the access of water supply and sanitation in collaboration with other departments. The Community Development Unit (CDU) of HUD&PHED has the responsibility to mobilise and organise the communities especially in rural areas for water supply, sanitation and hygiene services. Similar kind of initiative has been taken by the Local Government and Community Development Department of Punjab where it is working with local community based organizations to eliminate the sewerage ponds and support the local communities in achieving open defecation free environment.

There is considerable inequity within the Punjab province evident from the recently launched UNICEF report of Mapping of Inequities in Basic Water Supply and Sanitation Services in Pakistan during February 2015. The report is based on PSLM 2010-2011 district data. Another draft report of tehsil based equity mapping of Punjab September 2015, funded by UNICEF, indicated that there are inequity issues especially in relation to piped water supply and improved sanitation between rural and urban areas as well as income groups. Generally, the issues of income inequities are more common in sanitation coverage. The Government of Punjab has launched MICS 2014 on 15th March 2015 that provides a wealth of information about water and sanitation. A further analysis of MICS 2014 results is desirable to establish the SDG baseline for Punjab WASH Sector Plan 2014-2024. This would be complemented with budgetary analysis of WASH expenditures in Punjab to understand the trends and patterns across the districts. Overall, this analysis of MICS and budget is critical to develop equity mapping and analyse the achievements of Government of Punjab in last 2-3 years. This information will be

useful to inform the policy makers and politicians to mobilize the required resources and advocacy at the relevant forums.

Methodology

Datasets for the Study

The MICS is a household survey developed by UNICEF and it is capable of producing statistically sound, internationally comparable estimates of social indicators such as the MDG indicators. In Pakistan, Provincial Bureaus of Statistics provide leadership in their respective provinces to conduct the survey along with Planning and Development Departments with support from UNICEF. The latest MICS Punjab 2014 results were announced in May 2015 and it is up to district level. The Punjab WASH Sector Development Plan 2014-2024 used MICS data as a baseline for setting the targets. The study used basic raw datasets of MICS 2014 that were obtained directly from the Punjab Bureau of Statistics and UNICEF.

Wealth Quintile

The Wealth Index is a composite measure of a household's cumulative living standard. As used in the MICS 2011 report, the study adopted the Principal Components Analysis (PCA) approach for Wealth Index by using information on the ownership of consumer goods, dwelling characteristics, water and sanitation, and other characteristics that are related to the household's wealth to assign weights (factor scores) to each of the household assets. Each household was then assigned a wealth score based on these weights and the assets owned by that household. The survey household population was then ranked according to the wealth score of the household they are living in, and was finally divided into five equal parts called quintiles or three equal parts called tertiles. For quintiles, the five categories are: lowest (poorest), second (poor), third (middle), fourth (rich) and highest (richest) – comprising of five groups with an equal number of individuals in each category. For tertiles, the three categories are: low (poorest), middle (middle) and high (richest). The concept of tertiles has been applied at tehsil level as the sample size of some tehsils was very small and was not reflecting the true quintiles as in the case of districts.

The Wealth Index is particularly more valuable and reliable as there is paucity of reliable data on income and expenditures. The assets used in these calculations were as follows: number of rooms for sleeping per member; material used for floor, roof and wall of dwelling; type of cooking fuel; electricity; gas; radio; television; cable television; mobile and non-mobile phone; computer; internet

access; refrigerator; air conditioner; washing machine; cooler; microwave; sewing machine; iron; water filter; motorised pump; watch; bicycle; motorcycle/scooter; animal-drawn cart; car or truck; source of drinking water supply and type of sanitation facility.

The Wealth Index is assumed to capture the underlying long-term wealth through information on the household assets, and is intended to produce a ranking of households by wealth, from poorest to richest. The wealth index does not provide information on absolute poverty, current income or expenditure levels. The wealth scores calculated are applicable for only the particular data set they are based on. These assets were used to construct an asset index by using PCA methods described by Filmer and Pritchett¹, Rutstein & Johnson² and Córdova³. Following Filmer and Pritchett, many other studies, especially in the fields of economics and public policy, have been implemented and recommend the use of PCA for estimating wealth effects (Vyass and Kumaranayake⁴; Labonne, Biller and Chase⁵).

Access to Improved Water

The MICS 2014 report provides information about categories of water supply sources like piped water into dwellings, compounds, neighbours and public tap/standpipe, hand pump, motorised pump, protected well, etc. The MICS report categorises improved and unimproved water sources as given below:

Piped into dwelling	Improved Water
Piped into compound, yard or plot	Improved Water
Piped to neighbour	Improved Water
Public tap /Standpipe	Improved Water
Tube well	Improved Water
Hand pump (tap)	Improved Water
Motorised pump (donkey/Turbine)	Improved Water
Protected well	Improved Water
Protected spring	Improved Water

¹ Filmer D, Pritchett LH (2001) Estimating wealth effects without expenditure data - or tears: an application to educational enrollments in states of India. *Demography* 38(1): 115–32

² Rutstein SO, Johnson K (2004) DHS Comp. Reports 6: The DHS Wealth Index. Calverton, Maryland: ORC Macro

³ Abby Córdova. Methodological Note: Measuring Relative Wealth using Household Asset Indicators. *Americas Barometer Insights: 2008 (No.6)*

⁴ Vyass, Seema, and Lilani Kumaranayake. "Constructing Socioeconomic Status Indexes: How to Use Principal Component Analysis." *Health Policy and Planning* 21, no. 6 (2006): 459-68

⁵ Labonne, Julien, Dan Biller, and Rob Chase. "Inequality and Relative Wealth: Do They Matter for Trust? Evidence from Poor Communities in the Philippines." In *Social Development Papers, Community Driven Development*, The World Bank, 2007

Unprotected well	Unimproved Water
Unprotected spring	Unimproved Water
Pond (toba)	Unimproved Water
Tanker-truck	Unimproved Water
Cart with small tank/drum	Unimproved Water
Surface water (river, stream, dam, lake)	Unimproved Water
Other	Unimproved Water
Missing	Unimproved Water

Access to Improved Sanitation

The MICS 2014 report provides information about type of latrines including flush to piped sewer system, flush to septic tank, flush to pit latrine, flush to somewhere, pit latrine, etc. The MICS report 2011 categorises improved and unimproved sanitation as given below:

Flush to piped sewer system	Improved Sanitation
Flush to septic tank	Improved Sanitation
Flush to pit (latrine)	Improved Sanitation
Flush to unknown place / not sure / don't know	Improved Sanitation
Ventilated Improved Pit Latrine (VIP)	Improved Sanitation
Pit latrine with slab	Improved Sanitation
Composting toilet	Improved Sanitation

Flush to somewhere else	Unimproved Sanitation
Pit latrine without slab / open pit	Unimproved Sanitation
Bucket	Unimproved Sanitation
No facility, Bush, Field	Unimproved Sanitation
Other	Unimproved Sanitation
Missing	Unimproved Sanitation

Key Findings and Analysis

Access to Improved Water

The study analysed the data sets of MICS 2014 by placing the different sources of water supply under the categories of improved and unimproved water (as indicated in the methodology section). The analysis found that 94.3% population of Punjab has access to improved water with 96.8% in rural areas and 89.1% in urban areas. Within the cities, access to improved water in five major cities is lower with 86.8% compared to other cities with 91.5%. The break up of different sources of drinking water is given in **Table 1**.

Table 1 - Access to drinking water supply by source in Punjab

All source of drinking water	Urban %	Rural %	Total %
Piped into dwelling	25.8	4.6	11.6
Piped into compound, yard or plot	1.9	1.7	1.8
Piped to neighbour	1.1	0.8	0.9
Public tap /Standpipe	10.3	2.6	5.1
Tube well	0.9	0.7	0.8
Hand pump (tap)	8.6	41.5	30.6
Motorized pump (donkey/Turbine)	38.2	43.4	41.7
Protected well	0.5	1.1	0.9
Protected spring	0.1	0.4	0.3
Bottled water (mineral)	1.6	0.1	0.6
Improved Water	89.1	96.8	94.3
Unprotected well	0.0	0.3	0.2
Unprotected spring	0.0	0.2	0.2
Pond (toba)	0.0	0.3	0.2
Tanker-truck	0.3	0.1	0.2
Cart with small tank/drum	8.9	1.7	4.1
Surface water (river, stream, dam, lake)	0.1	0.2	0.1
Other	1.5	0.4	0.8
Missing	0.1	0.0	0.1
Unimproved Water	10.9	3.2	5.8

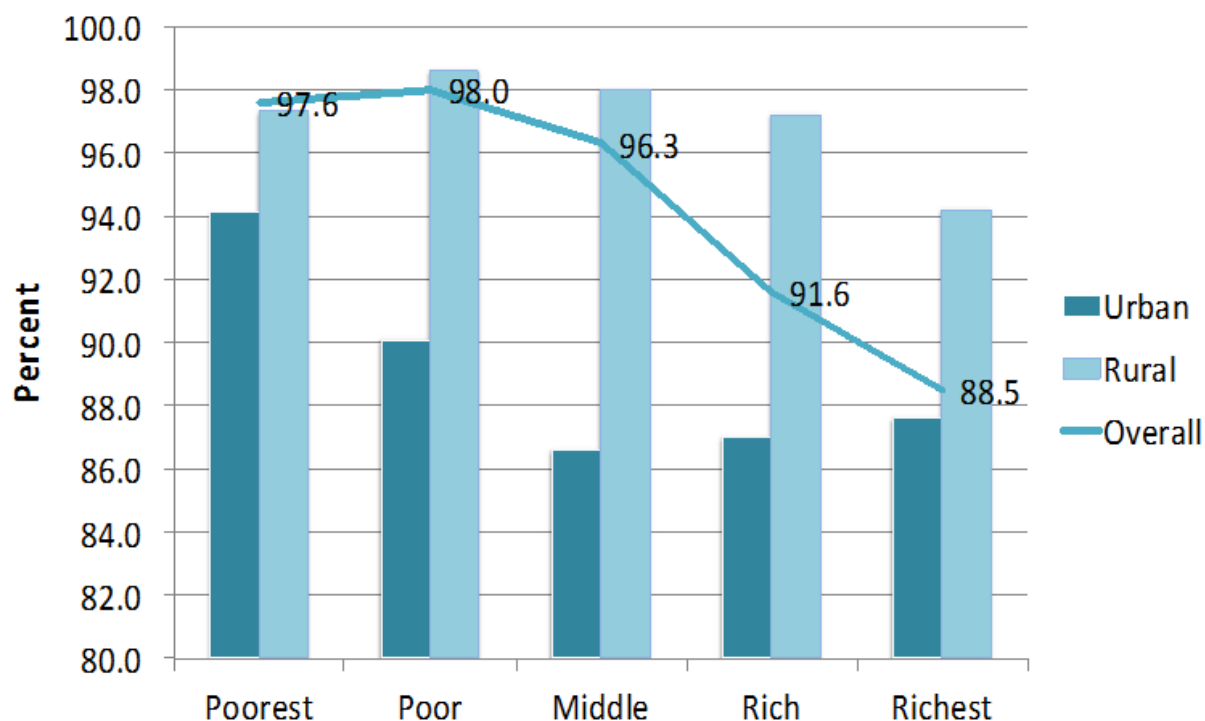
The motorised pumps (donkey/turbine) are the main source of drinking water supply with 41.7% coverage followed by hand pumps in 30.6% and piped water supply in 11.6%. In rural as well as urban areas, the main source of drinking water supply is motorized pump i.e. 43.4 % in rural areas and 38.2% in urban areas. While hand pumps are the second largest source of drinking water in rural areas i.e. 41.5% whereas it is only 8.6% in urban areas. The piped water supply in urban areas is 25.8% while it is only 4.6% showing a wider disparity in terms of rural urban divide.

A review of access to improved water in different quintiles reveals that the coverage goes down from the poorest to the richest, and it is more visible in urban areas compared to rural areas (**Fig 1**). This can be mainly attributed to the cart

with small tanks/drums, which are about 8.9% in urban areas and only 1.7% in rural areas, and the rich and richest group generally purchase from these. There is evidence from district Faisalabad, where 28.3% bring water in small carts/tanks by either purchasing the water or fetching it themselves. The details of district wise coverage of improved water with quintiles and mothers education, and rural and urban improved water wealth quintiles are given in Table 8 of Annexure. The results indicated no relation of wealth quintile and mother's education on improved water.

The lowest quintile and no education have better access to improved water's access compared to high quintile and higher education due to high usage of hand-pumps (improved source), which are easy to install within premises at shallow levels compared to the richest quintiles whom has less confidence on ground water extracted by hand pumps. Similarly, the richest quintiles have more access to piped water supply or motorized pumps. Further, at some places, drinking water is being carried on cart/donkey from some distances on payment and this is categorized as unimproved source. Such practices are more common in highest quintiles compared to the poorest and poor quintiles. For example 28.% in Faisalabad, 8.6% in Nankana Sahib, 7.8% in Sargodha and 7.1% in Rahim Yar Khan used drinking water carried on donkey carts. This needs further investigation to determine the reasons for lower usage of improved water in the highest quintiles.

Figure 3 - Access to improved water supply in Punjab by quintiles



The new definition of SDGs encourages the location of improved water sources within premises, and to be available when needed. Thus this information is key to determine the first and second ladder of SDG for safely managed water. Overall, 80.8% of the population has access to improved water sources located at their premises with higher in rural areas (84.3%) compared to urban areas (73.7%) as evident from **Table 2**. Interestingly, the lower wealth quintiles have more number of improved water sources within premises compared to higher wealth quintiles both in urban as well as rural areas because of high use of hand pumps.

Table 2: Improved and Unimproved Water Sources with Quintiles

	Improved sources (%)			Unimproved sources	Total
	Water in Premises	Elsewhere	Total		
Punjab	80.8	13.6	94.4	5.6	100
Lowest	84.3	13.4	97.6	2.4	100
Second	87.0	11.0	98.0	2.0	100
Middle	84.2	12.2	96.3	3.7	100
Fourth	77.0	14.6	91.6	8.4	100
Highest	71.5	17.0	88.5	11.5	100
Urban	73.7	15.4	89.1	10.9	100
Rural	84.3	12.8	97	3.0	100

The districts having coverage less than 60% with access to improved water sources within premises in Punjab are: Faisalabad (52.7%), Khushab (59.4%) and Rawalpindi (62.4%). The details of district with urban, rural and overall coverage of improved water within premises, overall improved water outside the premises, and unimproved water is given in **Table 3**.

Table 3: District wise Percentage of Access to Improved Water within Premises, Outside Premises and Not Improved

Districts	Improved Water in Premises					
	Urban	Rural	Overall	Overall Improved Water not in Premises	Unimproved Water	Total
Punjab	73.7	84.3	80.8	13.6	5.6	100
Faisalabad	41.9	62.7	52.7	17.2	30.2	100
Khushab	65.4	57.3	59.4	33.2	7.4	100
Rawalpindi	63.2	61.5	62.4	31.9	5.7	100
Gujrat	60.2	75.3	71.7	27.8	0.5	100
Nankana Sahib	49.6	78.5	72.0	19.5	8.6	100
Narowal	63.7	76.9	74.9	25.2	0.0	100
DG Khan	55.4	80.0	75.5	14.8	9.8	100
Sialkot	62.8	80.9	76.1	11.7	12.2	100
Sargodha	61.4	84.4	76.8	15.0	8.1	100
Attock	90.1	75.5	79.2	15.0	5.9	100
Mandi Bahauddin	69.3	81.3	79.5	18.7	1.8	100
RY Khan	57.9	85.6	79.7	13.0	7.3	100
Bahawalnagar	79.6	80.9	80.6	17.0	2.4	100
Okara	81.2	80.5	80.6	17.0	2.4	100
Jhelum	77.3	82.0	80.8	16.8	2.5	100
Gujranwala	81.0	82.1	81.5	12.7	5.8	100
Lahore	81.8	87.6	83.0	15.5	1.6	100
Chakwal	87.7	82.9	83.6	10.1	6.4	100
Rajanpur	96.1	82.5	84.4	13.6	2.0	100
Bahawalpur	80.1	86.6	84.6	11.9	3.5	100
Mianwali	98.4	81.6	84.7	11.4	3.9	100
TT Singh	65.9	91.0	85.4	10.5	4.0	100
Hafizabad	70.1	90.9	85.4	12.1	2.6	100
Kasur	82.9	88.6	86.9	11.2	1.9	100
Pakpattan	80.6	88.9	87.7	9.3	3.0	100
Vehari	77.4	89.8	87.8	10.7	1.5	100
Sahiwal	80.2	89.4	87.9	8.4	3.7	100
Lodhran	86.6	89.5	89.1	9.0	1.9	100
Multan	86.6	91.0	89.3	8.2	2.5	100
Sheikhupura	83.5	92.7	89.4	7.8	2.8	100
Chiniot	91.5	93.6	93.0	5.6	1.4	100
Jhang	91.4	95.6	94.8	4.4	0.8	100
Khanewal	91.3	95.9	95.1	4.0	0.9	100
Muzaffargarh	86.4	97.9	96.2	2.0	1.8	100
Bhakkar	99.4	97.6	97.9	2.1	0.0	100
Layyah	93.1	99.2	98.3	1.1	0.6	100

Figure 4 : Coverage of Improved Water in Districts of Punjab

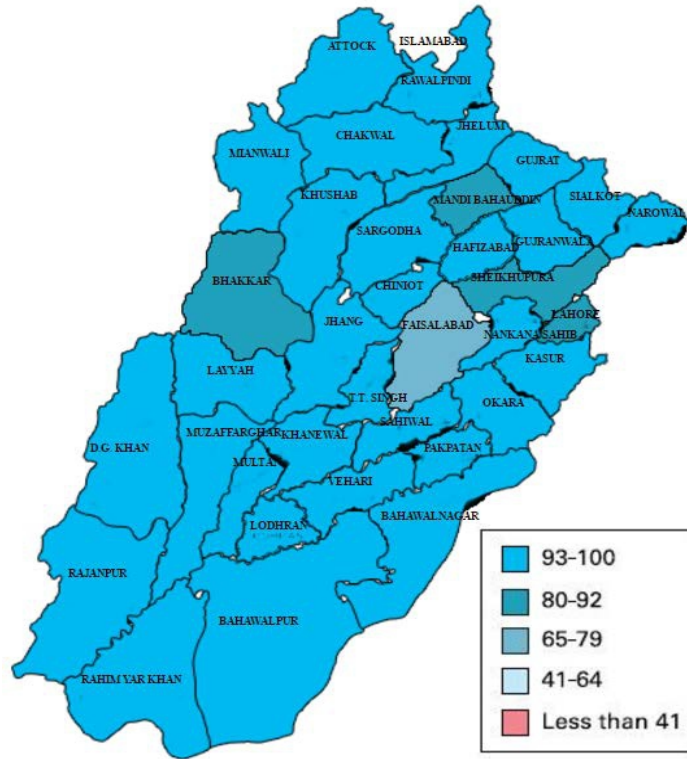
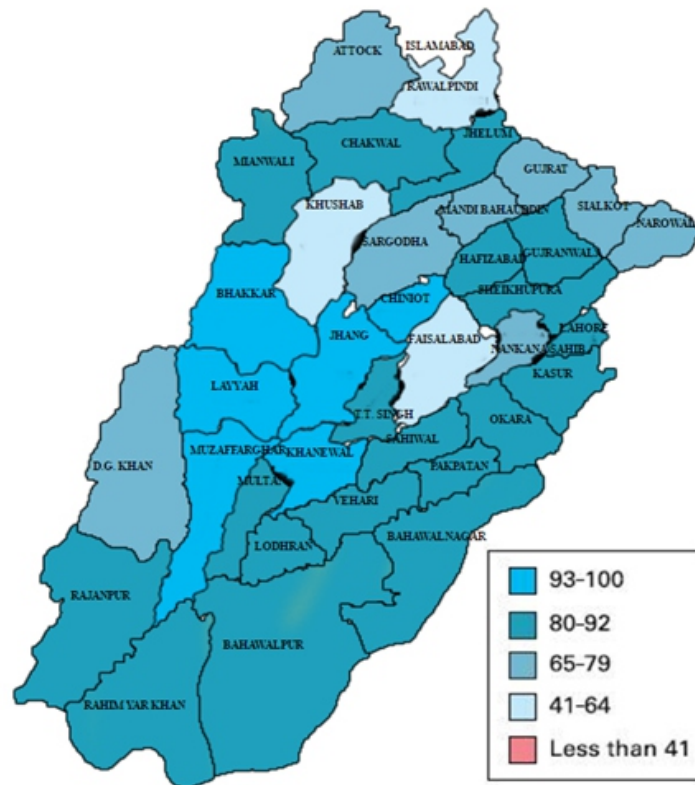


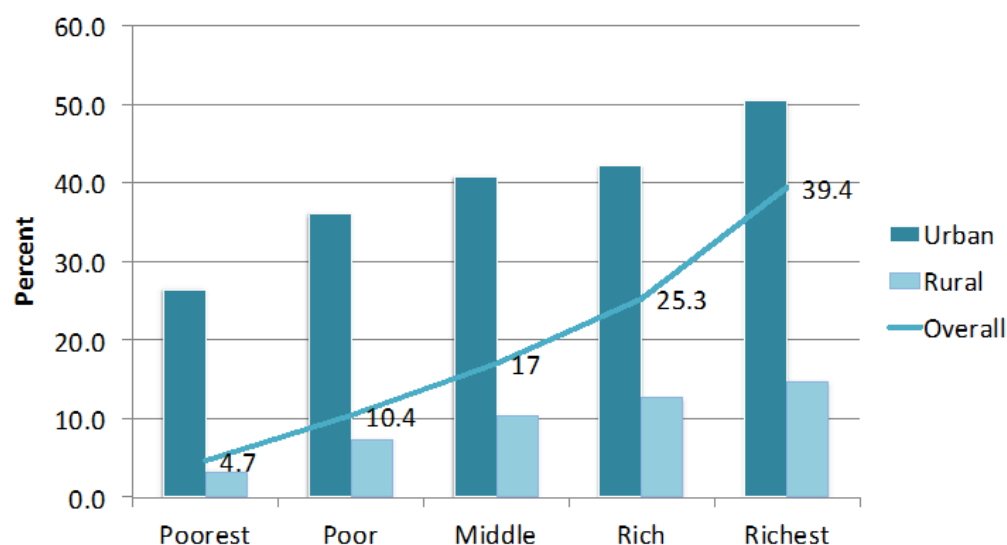
Figure 5: Coverage of Improved Water in Premises in Districts of Punjab



Access to Piped Water

The access to piped water supply in Punjab is 19.4%, which is higher in urban areas with 39.2% and lower in rural areas with 9.6%. Compared to MICS 2011, there is downward trend of access to piped water supply in Punjab. Further analysis also shows that poorest have significantly low access to piped water supply compared to richest both in rural as well as urban areas.

Figure 6 - Access to Piped Water Supply in Punjab by Quintiles



In terms of access to piped water supply, Lahore has the highest coverage with 64.6% followed by Bahawalnagar (41.9%), Rawalpindi (34.9%), Toba Tek Sing (29.4%) and Jhelum (25.3%).

In urban context, Lahore has the highest coverage with 76.9% followed by Bahawalnagar (61.6%), Kasur (54.2%), D G Khan (51.2%) and Rawalpindi (46.6%).

In rural context, the highest coverage is Bahawalnagar (36.8%) followed by Toba Tek Singh (25.9%), Chakwal (23.1%), Jhelum (21.9%) and Rawalpindi (21.1%).

The district profile of access to piped water supply by quintiles with overall, rural and urban coverage is given in Tables 11,12 and 13 under Annexures.

Sustainable Development Goals

In September 2015, the world adopted the Sustainable Development Goals (SDGs) as continuity of Millennium Development Goals (MDGs). As a developing country the government of Pakistan has conceived Vision 2025, which also emphasizes the key areas highlighted in SDGs. Unlike MDGs, the setting of new goals started with an ambition to achieve sustainable development. The development of SDG started in 2013, an extensive process of deliberations was adopted to finalize the goals with an open working group (OWG). Almost 70 countries participated in the initial draft of SDG, whereas an extensive feedback was sought to finalize the 17 goals with 169 sub-goal/targets as a final SDG agenda till 2030. Transforming the new SDG development framework into action framework requires, revising existing policies, resourcing the SDG framework and action plan, redesigning the monitoring framework and realigning the governance structure.

The SDGs were formally launched in Pakistan in October 2015 by the Ministry of Planning, Development and Reform. On 19th February, 2016, Pakistan became the first country in the world whose National Assembly passed a unanimous Resolution adopting the SDGs Agenda as its own national development agenda. This not only reflects the broad political support for the SDGs, but also clearly indicates that SDGs Agenda is now Pakistan's Development Agenda being called Pakistan Development Goals (PDGs). Further, the Speaker, National Assembly inaugurated a state-of-the-art SDGs Secretariat in the Parliament building in February 2016, which is now serving as a resource centre.

Though Pakistan made good progress towards MDGs of water and sanitation, but its overall achievements were below the envisaged targets for water and sanitation. However, the key factors that have played a role to decelerate the progress were compromised understanding, poor planning and gaps in tracking /monitoring the progress. All this led to an ineffective utilization of existing resources and the expected social impact could not be created which was necessary for MDGs.

The SDG 6 and its sub-goals 6.1 and 6.2 are related to drinking water and sanitation. To transform the SDGs into implementation plans with specific targets, the provincial and regional strategies and annual development plans need to be aligned with the SDGs, there is a need to know the current level of coverage (to serve as baseline as well as bench mark) newly defined SDGs related to water and sanitation.

SDG 6: Ensure availability and sustainable management of water and sanitation for all

SDG 6.1: Achieve universal and equitable access to safe and affordable drinking water for all.

SDG 6.2: Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation paying special attention to the needs of women and girls and those in vulnerable situations.

SDG -6.1: Safely Managed Water Services

Target 6.1: Achieve universal and equitable access to safe and affordable drinking water for all.

Indicator: Percentage of the population using safely managed drinking water services.

Definition: Population using an improved drinking water source, which is: located on premises, available when needed, and free of faecal and priority chemical contamination.

Based on above definition, by using MICS 2014 data and quality data furnished by PHED and PCRWR, the SDG for Punjab is 54.13%

MDG-SDG	Service ladder	Definitions	Coverage (%)	Source of information
SDG 6.1	Safely managed drinking water	Improved water supply facility that is located on premises, available when needed and that results in drinking water free from bacterial contamination	54.13% – PHED 35.55% - PCRWR	MICS 2014 Improved Water/Basic Water: 94.3% Water accessible and available in premises: 80.8% 33% of HHs reported having bacterial contamination as per PHED data so water free from bacterial contamination is: 67% Or 56% of HHs reported having bacterial contamination as per PCRWR data so water free from bacterial contamination is: 44% HHs using an improved water supply facility that is located on premises and free from bacterial contamination: $80.8\% * 0.67 = 54.13\%$ as per PHED $80.8\% * 0.44 = 35.55\%$ as per PCRWR
MDG continuity	Basic water/ Improved Water	Piped Water ofr all types, Motorized Pump, Hand Pump, protected well & srping, bottled water- mineral	94.3%	MICS 2014
	Unimproved water	Unprotected well & Spring, Pond (Toba), Tanker Truck, Cart with small tank/drum, surface water (river, stream, dam, lake), other, missing	5.7%	MICS 2014
	TOTAL OF THE ABOVE THREE CATEGORIES:		2% 100%	NMICS 2014

There are challenges in terms of water having water quality data so bifurcation for rural and urban areas has not been possible so same value is used for both urban as well as rural areas. Below n Table 4 is overall district summary of access to safely managed drinking water services. There are mixed kinds of zones for having poor access to safely managed water ranging from northern, central and southern Punjab.

Table 4: Safely Managed Drinking Water Services

Region/District	Overall	Improved	PHED Quality Data		PCRWR Quality Data	
	Improved Water for MICS 2014	Water in Premises MICS 2014	Bacterially Fit as per PHED	Safely Managed Water	Bacterially Fit as PCRWR	Safely Managed Water
Punjab	94.41	80.79	0.67	54.13	0.44	35.55
Urban	89.08	73.70	0.67	49.38	0.44	32.43
Rural	97.04	84.28	0.67	56.47	0.44	37.08
Gujrat	99.21	71.69	0.10	7.50	0.37	26.53
Narowal	98.52	74.85	0.12	9.30	0.40	29.94
Gufranwala	98.60	81.53	0.13	10.91	0.00	0.00
Khushab	100.00	59.44	0.30	18.03	0.39	23.18
DG Khan	98.05	75.46	0.27	20.40	0.52	39.46
Nankana Sahib	98.10	71.96	0.38	27.19	0.77	55.41
Mianwali	97.19	84.71	0.46	38.94	0.37	31.34
Rawalpindi	97.53	62.43	0.63	39.33	0.18	11.24
Mandi Bahauddin	91.43	79.49	0.51	40.45	0.38	30.21
Faisalabad	69.80	52.65	0.78	41.32	0.42	22.11
Sialkot	100.00	76.09	0.56	42.44	0.72	54.78
Lahore	87.82	82.99	0.54	44.44	NA	NA
Okara	94.28	80.63	0.62	49.62	0.00	0.00
Lodhran	98.14	89.06	0.61	54.38	0.37	33.22
Bahawalpur	92.72	84.58	0.66	55.83	0.48	40.48
Attock	96.47	79.16	0.71	56.21	0.48	38.00
Kasur	97.44	86.91	0.66	57.72	0.86	74.74
Sahiwal	97.60	87.87	0.69	60.68	0.39	34.32
Vehari	96.12	87.83	0.69	61.03	0.38	33.78
Bahawalnagar	97.65	80.62	0.81	65.66	0.91	73.06
Rajanpur	93.61	84.44	0.78	65.98	0.86	72.96
Hafizabad	95.96	85.38	0.79	67.40	0.15	12.81
Chakwal	99.43	83.55	0.83	68.96	0.52	43.45
Jhelum	99.48	80.77	0.91	73.60	0.35	28.27
Sheikhupura	91.88	89.38	0.85	75.93	0.99	88.49
Sargodha	96.97	76.84	1.00	76.84	0.39	29.97
Pakpattan	94.14	87.68	0.88	77.23	NA	NA
TT Singh	92.65	85.43	0.94	80.54	0.80	68.34
Multan	97.53	89.32	0.91	81.71	0.15	13.74
Khanewal	98.19	95.06	0.87	82.65	0.42	40.30
Chiniot	98.17	93.01	0.91	84.46	NA	NA
Bhakkar	90.25	97.86	0.95	92.52	0.91	89.05
Layyah	98.45	98.30	0.96	94.01	0.00	0.00
Jhang	94.20	94.80	1.00	94.80	0.50	47.40
Muzaffargarh	99.06	96.19	NA	NA	0.35	34.08
RY Khan	96.29	79.72	NA	NA	0.50	39.86

Figure 7: Bacterial Contamination at Consumers Level- PHED Data

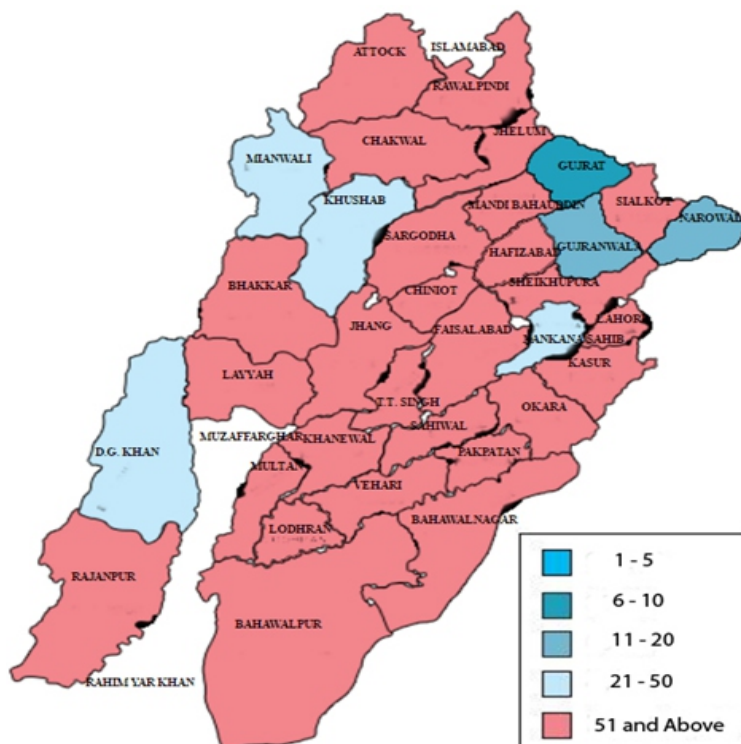
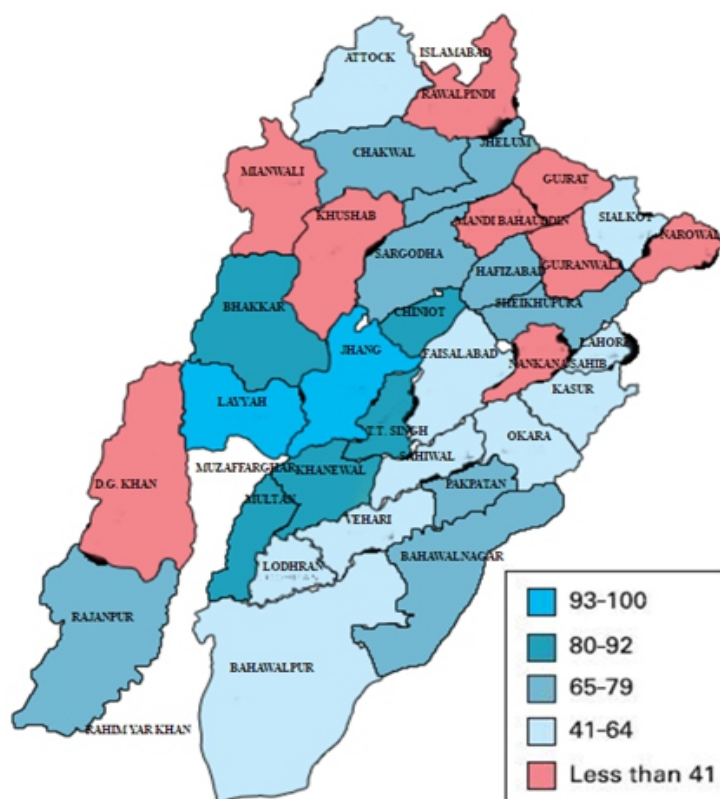


Figure 8 : Safely Managed Water at HHs Levels



Access to Improved Sanitation

The overall access to improved sanitation is 75.1% as per MICS 2014 compared to 72.1% in MICS 2011 that categorized different types of toilets into category of improved and unimproved sanitation (as indicated in Table 5 below). The rate of improved sanitation in urban area is 92.1% compared to rural areas with 66.8%. In simple words, two out of every three persons in rural areas of Punjab have improved sanitation. The break-up of different types of toilets in Punjab is given in Table 5.

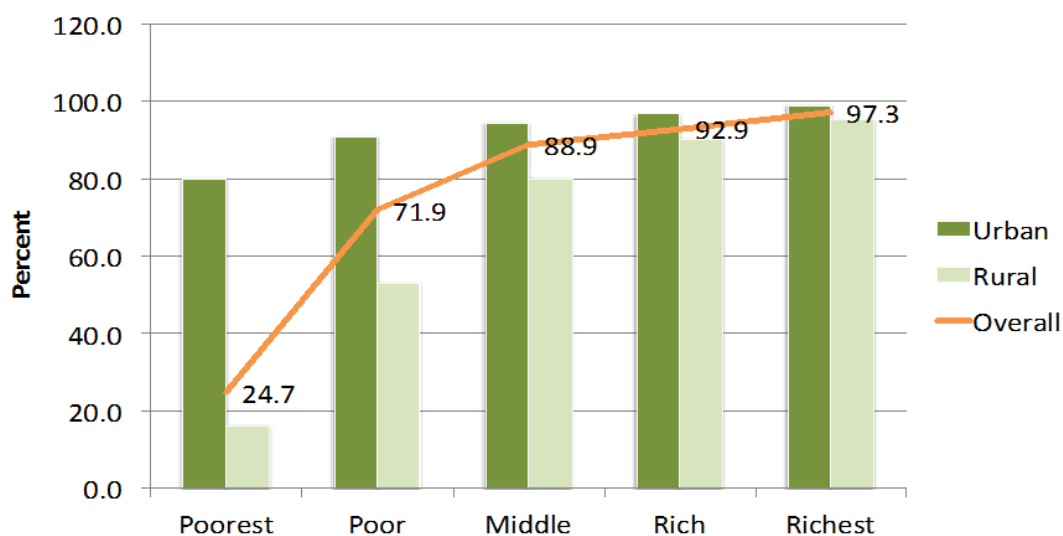
Table 5 - Access to sanitation in Punjab

All source of Sanitation	Urban %	Rural %	Total %
Flush to piped sewer system	56.3	4.1	21.3
Flush to septic tank	33.8	49.1	44.1
Flush to pit (latrine)	1.5	12.2	8.7
Flush to unknown place / not sure	0.3	0.3	0.3
Ventilated improved pit latrine (VIP)	0.1	0.3	0.2
Pit latrine with slab	0.1	0.8	0.6
Composting toilet	0.0	0.0	0.0
Improved Sanitation	92.1	66.8	75.1
Flush to somewhere else	6.2	7.2	6.9
Pit latrine without slab / open pit	0.1	0.3	0.2
Bucket	0.0	0.0	0.0
No facility, Bush, Field	1.3	25.4	17.5
Other	0.1	0.3	0.2
Missing	0.3	0.1	0.1
Unimproved Sanitation	7.9	33.2	24.9

Overall, the toilets connected with septic tanks are the leading type of sanitation system used in Punjab in 44.1%, followed by Flush to Piped Sewer system (21.3%) and then No Facility/Bush/Fields called as open defecation (17.5%). In urban areas, the leading system of sanitation is flush connected with piped sewer system in 56.3%, followed by flush to septic tank in 33.8% and about 6.2 % flush connected to somewhere including open drains. In rural areas, the main system of sanitation is flush to septic tank in 49.1 %, followed by open defecation in 25.4%, flush to pit latrine in 12.2%, flush to piped sewer system in 4.1% and flush to somewhere else in 7.2%. Hence, one out of every four persons in rural Punjab is engaged in the practice of open defecation.

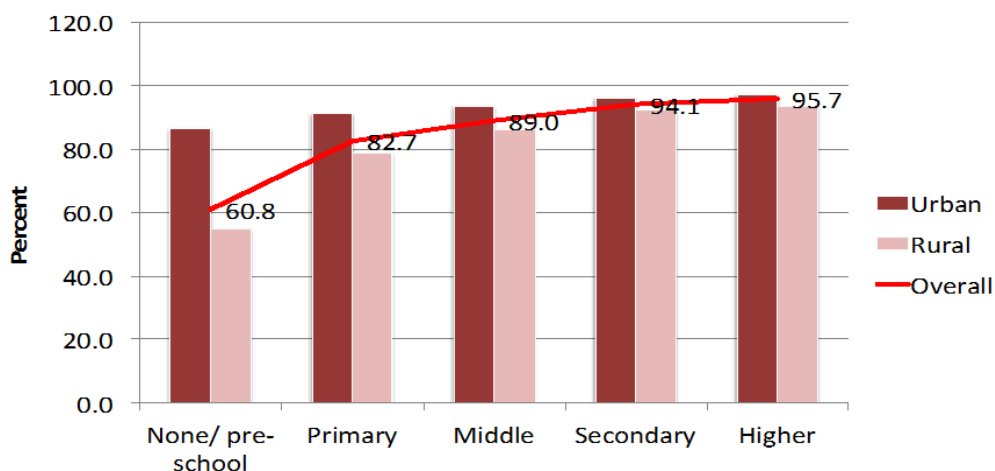
A review of access to improved sanitation with wealth quintiles show a very proportionate relationship that higher the poverty lower the improved sanitation. Compared to 24.7% coverage in the poorest, the access to improved sanitation in the richest is 97.3% (See Figure 7). Similarly, in urban areas, the access to improved sanitation in the lowest quintile is 80% compared to 98.9% in the richest. While in rural areas, the access to improved sanitation in the lowest quintile is 16.2% compared to 95% in the richest.

Figure 9 - Access to improved sanitation in Punjab by quintiles



Similarly, there is a wide disparity in terms of access to improved sanitation between mothers with no education or pre-schooling to mothers with higher education. The access to improved sanitation for mothers with no education/pre schools is 60.8% compared to mothers with higher education 95.7%.

Figure 10 - Access to improved sanitation in Punjab by Mother's Education



This disparity is not very high in urban areas where access to improved sanitation for mothers with no education/ pre schooling is 86.2% compared to 97.1% for mothers with higher education. However this disparity is very deep in rural areas where access to improved sanitation for mothers with no education/ pre schooling is only 54.8% compared to 93.1% for mothers with higher education.

The five bottom districts in terms of access to improved sanitation in Punjab are: Khanewal (45.7%), Rajanpur (49.6%), Jhang (51.3%), Vehari (51.8%), and

Multan (52.3%). Further details of district urban and rural improved sanitation are given in Table(s) 14, 15 and 16 in Annexure. There is clear disparity of access to improved sanitation in the higher the disparities between wealth quintiles as well as between no school/pre school and higher education.

Open Defecation

The overall population practicing open defecation in Punjab is 17.5%. This includes population without toilet facilities and reporting fields and bushes for defecation. Compared to only 1.2% population of urban areas, around 25.4% in rural areas of Punjab are practicing open defecation clearly depicting that open defecation is an issue of rural sanitation. Simply, one out of every four persons in rural areas of Punjab is engaged in open defecation practice. The figure 05 also shows the open defecation is highly skewed towards the poverty as 69.4% of the poorest practice open defecation compared to zero per cent of the richest. Similarly, in rural areas, 80.3% of the poorest practice open defecation compared to zero per cent of the richest.

Figure 11 – Open Defecation Practices in Punjab by quintiles

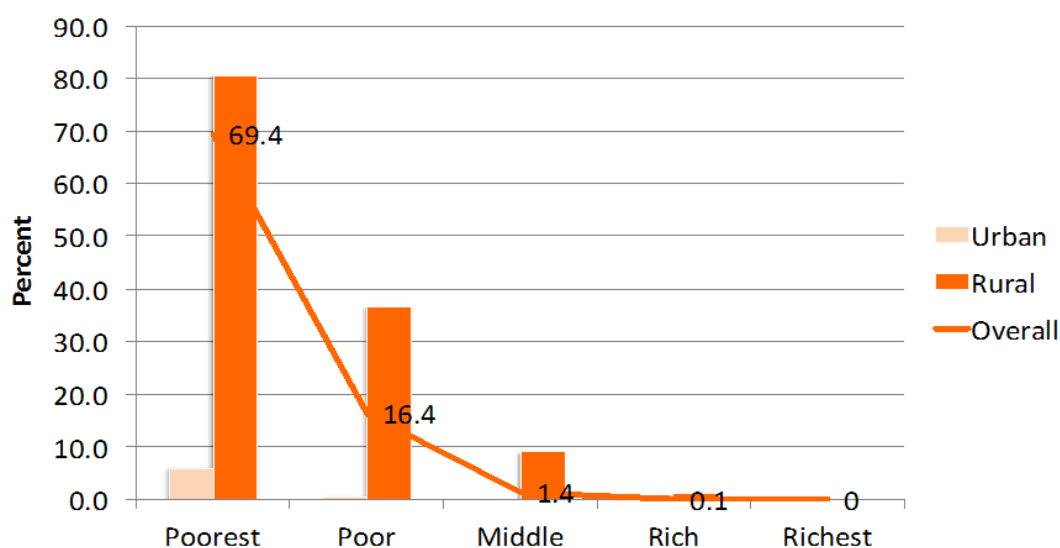
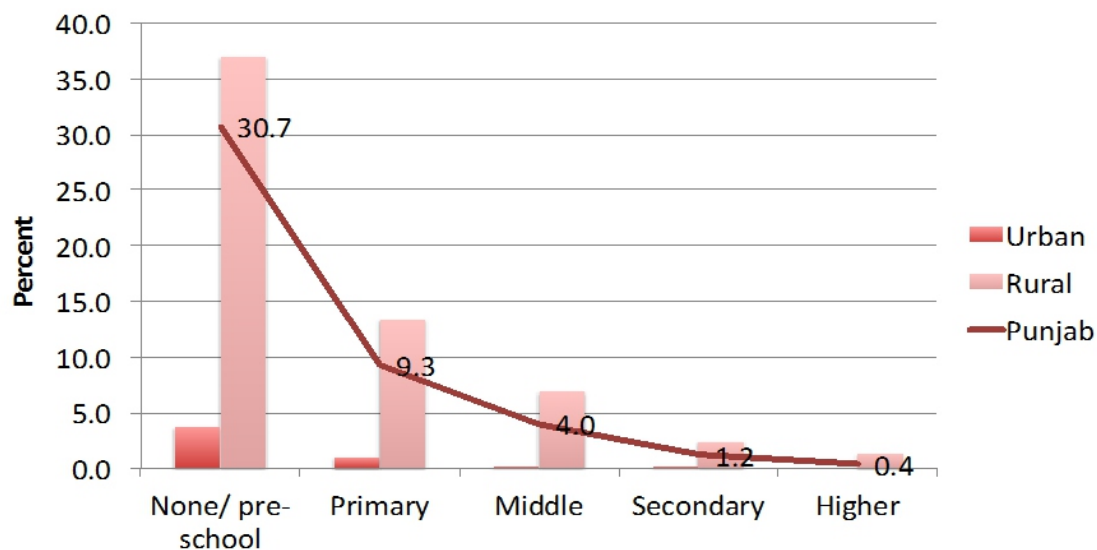


Figure 12 – Open Defecation in Punjab by Mother’s Education



Similarly, the level of open defecations is high in households where mothers have no education or pre schooling (30.9%) compared to the households where mothers have higher education (0.4%). Compared to only 3.7% of HHs in urban areas where mothers have no education/pre schooling, 37% are reported in rural areas showing a wider disparity between income and geographical locations.

The district having more than 30% of open defecation are: Rajanpur (49.4%), Muzaffargarh (42.8%), Chiniot (39.2%), DG Khan (38.6%), Jhang (38.3%), Khushab (34.9%), Bhakkar (30.9%) and Bahawalnagar (30.6%). The profile districts with level of open defecation with wealth quintiles and mothers education are given Table 17. However, the urban and rural profile of districts with wealth quintiles is given in Table 18 and 19 in the annexure.

Figure 13 : Improved Sanitation in Districts of Punjab

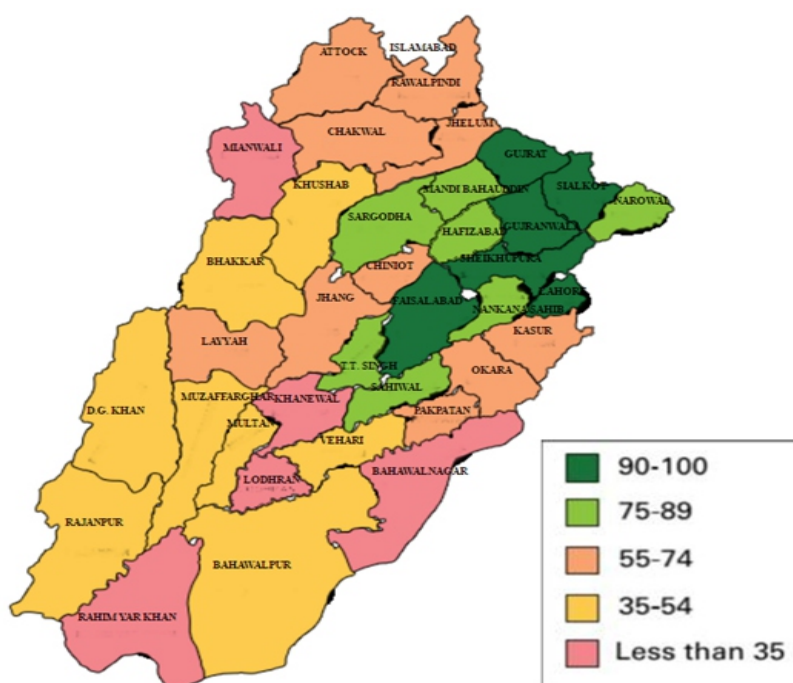
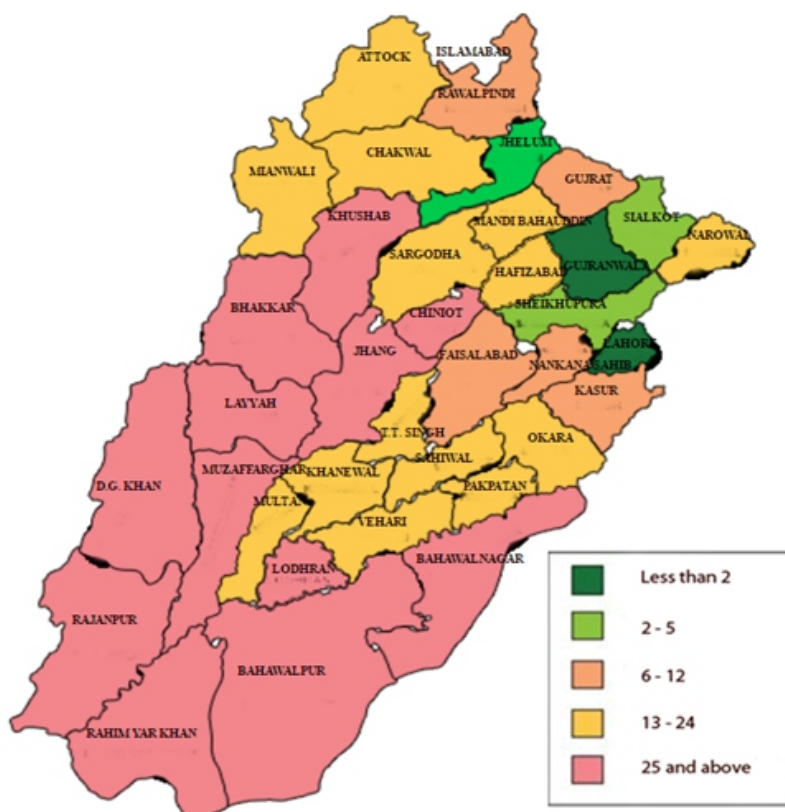
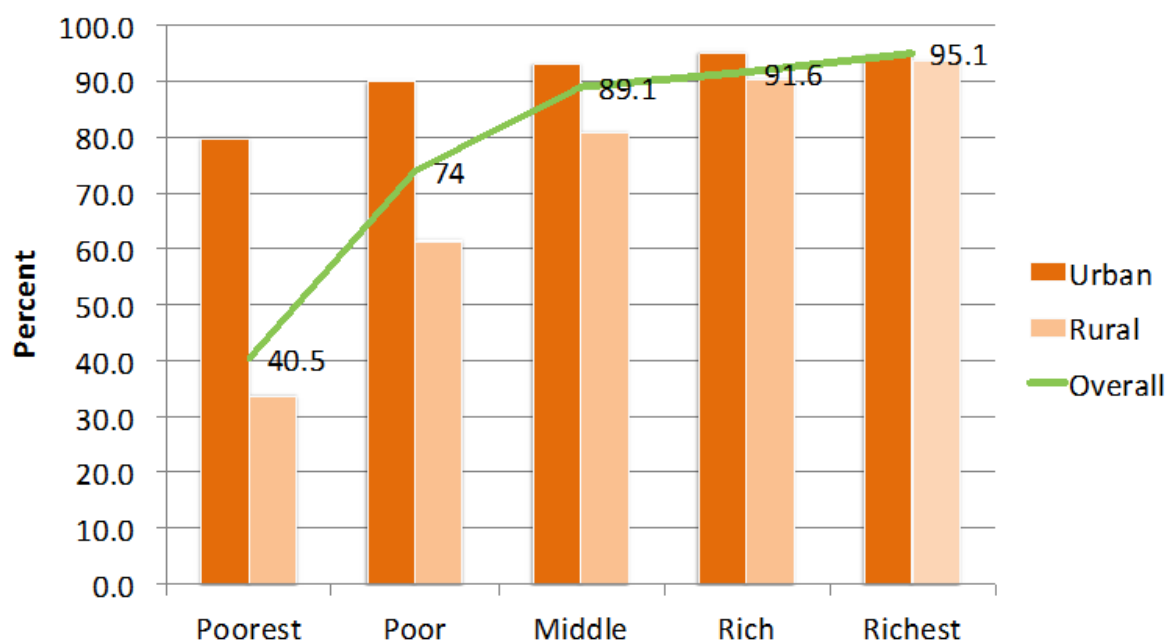


Figure 14: Open Defecation in Districts of Punjab



Hygiene – Hand Washing

Poor hygiene is the main carrier of majority of water borne diseases especially inappropriate personal hygiene including hand wash at critical times. In MICS 2014, nearly 78.1% population of Punjab reported to use water and soap for personal hygiene and hand wash at critical times with 90.5% in urban areas and 72 % in rural areas. More than three out of every four persons in Punjab reported the use of water with soap for their personal hygiene.



There is a clear disparity between income quintiles as only 40.5% of the poorest use water and soap for hand washing compared to 95.1% of the richest. In urban areas, there is less disparity as 79.7% use water and soap for hand washing compared to 90.5% of the richest. However, there is a great disparity between the poorest (33.7%) and the richest (72%) in rural areas for using water and soap for hand washing.

Similarly, there is low number of HHs reporting hand washing with water and soap with no education/pre schooling (66.7%) compared to higher education (93.7%). Such disparity is much stronger in rural areas compared to urban areas. As in rural areas, 62.3% of HHs with mothers of no education/pre schooling reported hand washing with water and soap compared to 91.5% of the richest. While this disparity in urban area is only 85.6% in HHs with mothers of no education/pre schooling compared to 93.8% of the richest. The districts with poor hand washing practices of water and soap are predominately from Southern Punjab and a few examples are: DG Khan (44.2%), Rajanpur (44.4%), Muzaffargarh (55.7%) and Bhakkar (59.4%). The details of Hand Washing with soap and water are in Table 20, 21 and 22 of Annexure.

SDG 6.2 - Safely Managed Sanitation Services

SDG Target 6.2: Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation paying special attention to the needs of women and girls and those in vulnerable situations.

Indicator: percentage of the population using safely managed sanitation services, including a hand-washing facility with water and soap.

Definition: population using an improved sanitation facility (including a hand washing facility with water and soap) that is not shared with other households and where the excreta are safely disposed in situ or transported and treated off-site.

Based on above definition, by using MICS 2014 data for improved sanitation and hand washing with water and soap, the safely managed improved sanitation services at HHs level in Punjab is 51%. The basis of calculations are given below

MDG-SDG	Service ladder	Definitions	Coverage (%)	Source of information
SDG 6.2	Safely managed sanitation	Private improved facility where faecal wastes are safely disposed on site or transported and treated off-site, plus a hand washing facility with soap and water	51%	HHs from Improved Sanitation that contains only connections with septic tanks and sewers are: 65.36% HHs having hand washing with water and soap: 78.1% DISCOUNTED for the proportion that has a hand washing facility with soap and water: $65.36 * 0.78 = 51\%$
MDG continuity	Basic sanitation/ Improved Sanitation	Flush: with piped sewer, septic tanks, pit latrine; VIP, pit latrines with slabs, and composting toilet	75.1%	MICS 2014
	Unimproved sanitation	Flush to somewhere else, pit latrines without slabs, bucket, etc.	24.9%	MICS 2014
	No service	Open defecation, missing, others	17.8%	MICS 2014
	TOTAL OF THE ABOVE FOUR CATEGORIES:		100%	

The safely managed sanitation services are 81.55% in urban areas and 38.30% in rural areas clearly showing a disparity between rural and urban areas, and demand for concerted efforts regarding rural sanitation in Punjab. The table below clearly

shows that districts from Southern Punjab are highly marginalized with poor coverage of safely managed sanitation services.

Table 6: Safely Managed Sanitation Services at HH Levels.

Area	SDG using Improved Sanitation of MICS 2014			SDG using improved sanitation of only sewer and septic tanks from MICS 2014		
	Improved Sanitation of all types	Hand Wash with water & Soap	Safely Managed Sanitation Services	Improved Sanitation- Sewer and Septic only	Hand Wash with water & Soap	Safely Managed Sanitation Services
Punjab	75.10	78.10	58.58	65.36	78.10	51.05
Urban	92.10	90.50	83.35	90.11	90.50	81.55
Rural	66.80	72.00	48.10	53.20	72.00	38.30
Bahawalpur	62.80	63.10	39.63	40.15	63.10	25.33
Bahawalnagar	57.30	67.50	38.68	24.48	67.50	16.53
R Y Khan	59.10	61.30	36.23	26.41	61.30	16.19
D G Khan	56.40	44.20	24.93	42.85	44.20	18.94
Layyah	69.10	66.50	45.95	62.48	66.50	41.55
Muzaffargarh	54.80	55.70	30.52	46.97	55.70	26.16
Rajanpur	49.60	44.40	22.02	43.22	44.40	19.19
Faisalabad	92.00	91.10	83.81	91.39	91.10	83.25
Chiniot	58.80	74.60	43.86	58.34	74.60	43.52
Jhang	51.30	73.60	37.76	48.41	73.60	35.63
T T Singh	80.50	79.10	63.68	75.41	79.10	59.65
Gujranwala	96.00	90.30	86.69	95.92	90.30	86.61
Gujrat	92.90	93.20	86.58	92.94	93.20	86.62
Hafizabad	80.00	87.70	70.16	79.89	87.70	70.07
M Bahauddin	75.60	89.10	67.36	74.90	89.10	66.74
Narowal	78.30	87.10	68.20	78.26	87.10	68.16
Sialkot	92.70	88.60	82.13	92.73	88.60	82.16
Lahore	96.90	93.50	90.60	95.16	93.50	88.98
Kasur	68.60	76.70	52.62	67.96	76.70	52.13
Nankana Sahib	89.20	87.10	77.69	89.00	87.10	77.52
Sheikhupura	91.90	91.50	84.09	91.64	91.50	83.85
Multan	52.30	72.10	37.71	46.93	72.10	33.84
Khanewal	45.70	71.70	32.77	34.06	71.70	24.42
Lodhran	54.30	68.10	36.98	26.85	68.10	18.29
Vehari	51.80	76.80	39.78	35.22	76.80	27.05
Sahiwal	77.30	86.20	66.63	76.06	86.20	65.57
Pakpattan	71.50	84.50	60.42	54.64	84.50	46.17
Okara	67.40	81.80	55.13	58.30	81.80	47.69
Rawalpindi	91.40	78.40	71.66	68.85	78.40	53.98
Attock	81.80	86.10	70.43	66.14	86.10	56.95
Chakwal	83.10	87.40	72.63	62.43	87.40	54.56
Jhelum	83.40	90.30	75.31	56.67	90.30	51.17
Sargodha	76.80	78.30	60.13	75.52	78.30	59.13
Bhakkar	68.80	59.40	40.87	37.10	59.40	22.04
Khushab	64.50	62.80	40.51	47.29	62.80	29.70
Mianwali	85.50	62.90	53.78	32.19	62.90	20.25

Figure 16 Hand Washing with Water and Soap in District of Punjab

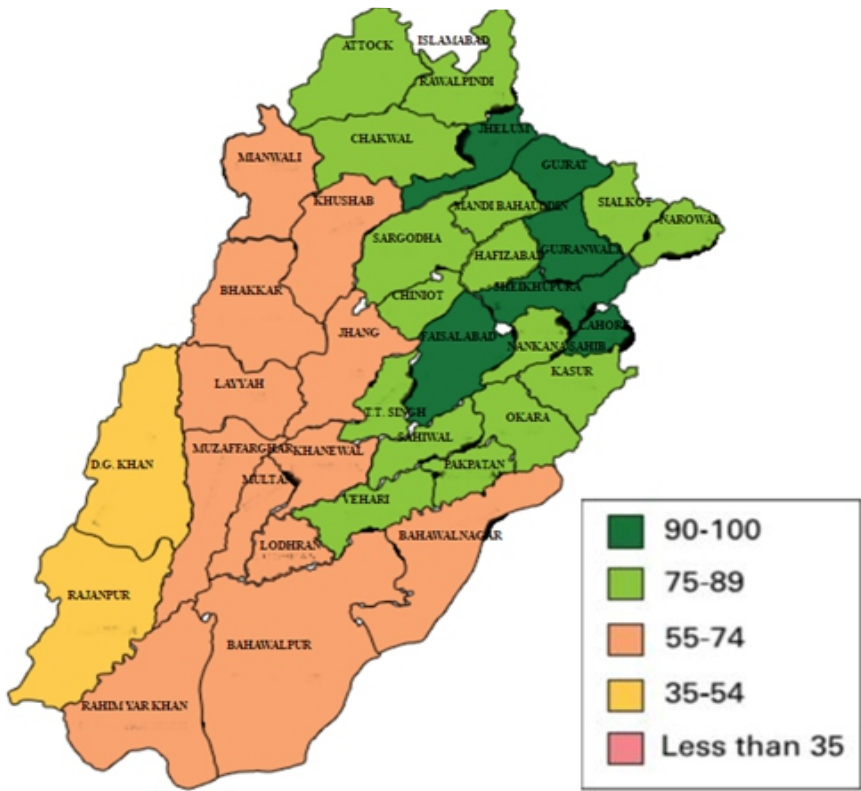
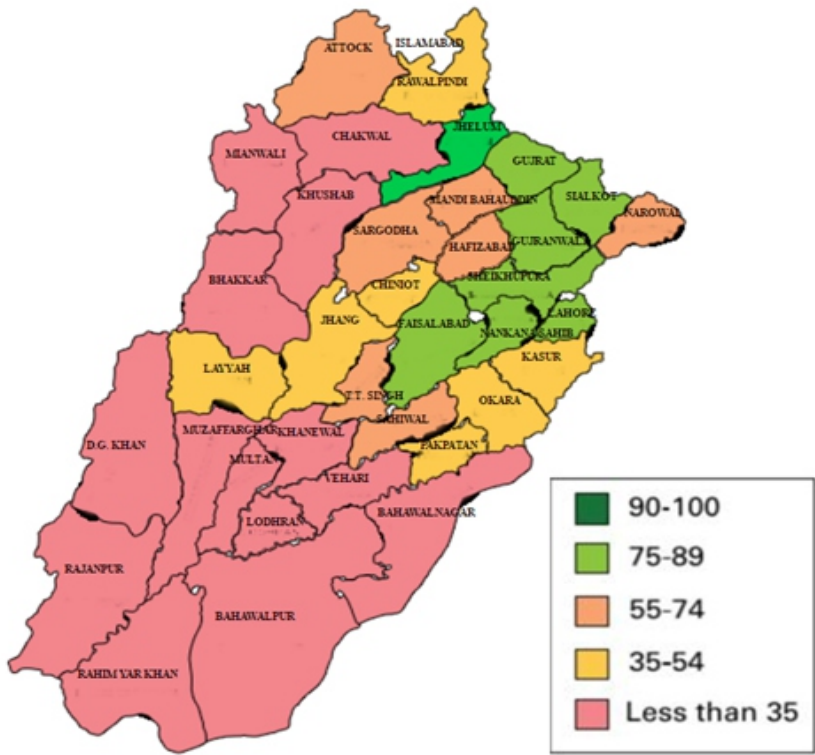


Figure 17 Safely Managed Sanitation (Sewer &Septic) at HHs Level



Stunting and Open Defecation Trends

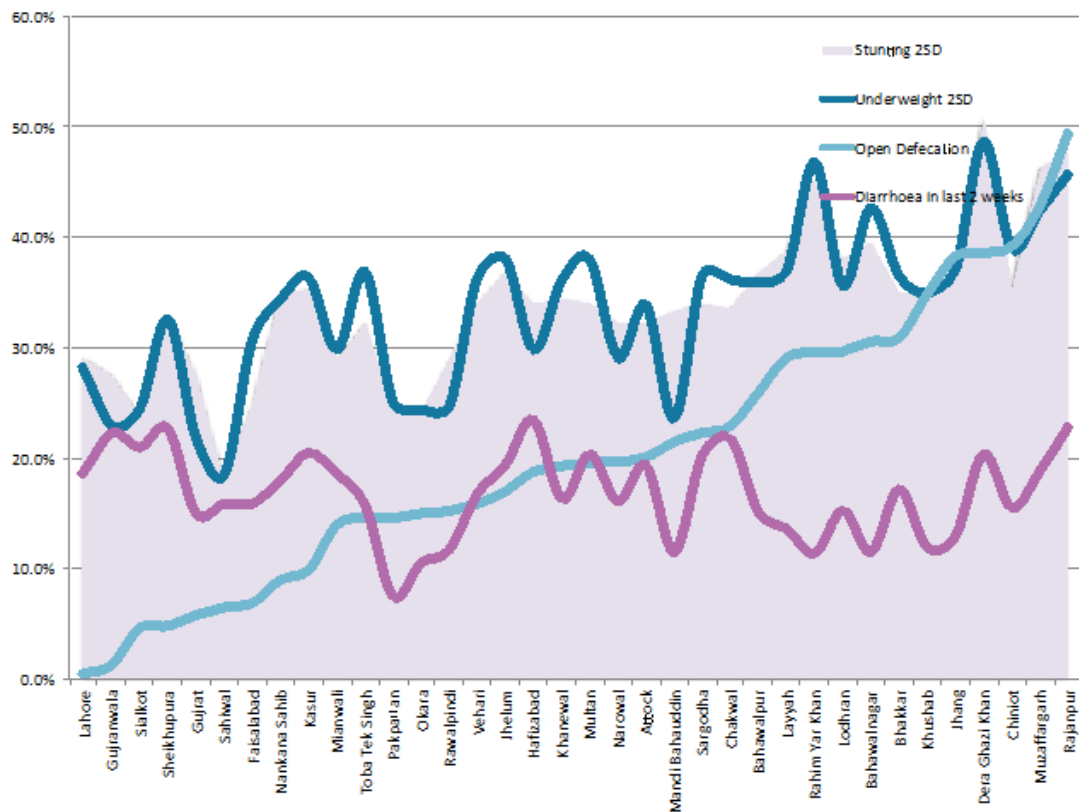
The overall stunting under five years children in Punjab province is found 33.5% as per MICS 2014 and this is 26.3% in urban areas and 36.7% in rural areas. Simply, one out of every three children in Punjab is suffering from malnutrition. We analysed the data of sanitation in the context of stunting to identify the trends and prevalence of stunting in different types of sanitation. The prevalence of stunting is slightly less with improved sanitation compared to overall prevalence of stunting. The stunting is high in population with unimproved sanitation. Further, this is significantly high with open defecation.

Table 7: Stunting with Types of Sanitation

Districts	Stunting (%age below -2SD)			
	Overall Stunting	Improved Sanitation (IMS)	Un-Improved	Open Defecation (OPD)
Punjab	33.5	29.3	44.8	48.3
Urban	26.3	25.7	33.0	44.4
Rural	36.7	31.5	46.0	48.4
Bahawalpur	36.7	29.0	48.6	49.9
Bahawalnagar	39.6	30.8	50.1	52.3
RY Khan	45.3	41.7	50.1	51.8
DG Khan	50.9	41.1	62.5	63.3
Layyah	38.8	37.4	41.4	42.4
Muzaffargarh	46.3	38.0	54.2	54.4
Rajanpur	47.6	40.7	53.1	53.1
Faisalabad	25.0	23.8	35.4	37.8
Chiniot	35.5	33.7	37.9	38.2
Jhang	36.9	29.0	45.3	47.5
TT Singh	32.4	28.7	43.3	47.2
Gujranwala	27.7	26.6	51.5	61.6
Gujrat	27.7	26.1	45.8	51.2
Hafizabad	34.0	31.0	46.2	46.8
Mandi Bahauddin	33.3	31.2	38.7	40.9
Narowal	32.3	29.0	43.7	47.7
Sialkot	24.0	22.8	37.2	39.3
Lahore	29.2	28.5	51.3	68.3
Kasur	35.4	33.5	39.3	38.3
Nankana Sahib	35.0	33.7	46.7	45.6
Sheikhupura	33.2	32.5	41.9	54.3
Multan	34.1	28.8	39.6	53.6
Khanewal	34.5	33.7	35.1	43.8
Lodhran	38.0	33.3	43.4	48.2
Vehari	34.0	30.0	37.7	39.8
Rawalpindi	18.2	17.0	28.9	28.3
Attock	24.1	21.4	35.3	35.4
Chakwal	23.9	21.4	37.3	41.7
Jhelum	28.8	24.7	48.1	49.9
Sahiwal	32.3	27.6	45.8	45.8
Okara	33.5	29.0	41.9	48.7
Pakpattan	36.9	34.0	44.0	52.2
Sargodha	34.1	31.6	41.3	43.1
Bhakkar	35.0	31.8	40.4	40.4
Khushab	34.7	32.2	39.5	39.9
Mianwali	28.9	29.2	27.0	26.6

The figure below clearly reveals that increase in stunting is directly linked with high open defecation

Figure 18 : Stunting with Open Defecation, Underweight and Diarrhoea



Conclusion

1. Access to improved water sources in Punjab stands at 94.3% and this is high in rural areas with 96.8% compared to urban areas with 89.1%. The poorest groups have more access to improved water sources compared to the richest groups due to high usage of hand pumps for ground water at shallow levels. This difference is significantly high in urban areas where about 88.5% of the richest have access to improved water sources compared to 97.6% in the poorest. Similarly, there are areas where the communities purchase water from donkey cart carriers that are categorized under unimproved water, and these are mainly from the highest quintile. This also indicates the issues of trust on water quality.
2. Overall, 80.8% of the population has access to improved water sources located at their premises with higher in rural areas (84.3%) compared to urban areas (73.7%). Access to improved water within premises is higher in the poorest (84.3%) compared to the richest (71.5%) due to high volumes of hand pumps which are cheap to install at shallow levels and easy to operate for drinking and domestic purposes.
3. In terms of access to piped water supply, there is a huge contrast between urban and rural areas where about 39.2% of urban areas have access to piped water compared to only 9.6% of rural areas. Within different quintiles, and compared to 4.7% of the poorest, 39.4% of the richest have access to piped water.
4. Percentage of the population with safely managed drinking water services (Population using an improved drinking water source, which is: located on premises, available when needed, and free of faecal and priority chemical contamination). The safely managed drinking water at HHs level is 54.13%
5. The overall access to improved sanitation is 75.1% as per MICS 2014 compared to 72.1% in MICS 2011. The rate of improved sanitation in urban area is 92.1% compared to rural areas with 66.8%. Compared to 24.7% coverage in the poorest, the access to improved sanitation in the richest is 97.3%. The access to improved sanitation for mothers with no education/pre schools is 60.8% compared to mothers with higher education 95.7%.
6. The overall population practicing open defecation in Punjab is 17.5% with 1.2% in urban areas and around 25.4% in rural areas. 69.4% of the poorest practice open defecation compared to zero per cent of the richest. There is high open defecation in HHs with mothers having no education or pre schooling

(30.9%) compared to the households where mothers have higher education (0.4%).

7. 78.1% population of Punjab reported to use water and soap for personal hygiene and hand wash at critical times with 90.5% in urban areas and 72 % in rural areas. Only 40.5% of the poorest use water and soap for hand washing compared to 95.1% of the richest. The low number of HHs reporting hand washing with water and soap with no education/pre schooling (66.7%) compared to higher education (93.7%).
8. The percentage of the population with safely managed sanitation services, including a hand-washing facility with water and soap (population using an improved sanitation facility (including a hand washing facility with water and soap) that is not shared with other households and where the excreta are safely disposed in situ or transported and treated off-site). The safely managed improved sanitation services at HHs level in Punjab is 51% with 81.55% in urban areas and 38.30% in rural areas.
9. The stunting is significantly high in population with open defecation (48.3%) compared to improved sanitation (29.3%) portraying a strong relationship between open defecation and stunting.

Recommendations

1. A research study should be conducted to know the reasons of low improved water sources in the richest (highest quintile) compared to the poorest (1st quintile). This should also add the aspect of reasons of low coverage of improved water in premises in high quintile compared to lower quintile.
2. The Government of Punjab has been pursuing the installation of water filtration plants especially in rural areas to ensure the availability of safe drinking water. The new MICS should include water filtration as separate question but more importantly there is need for consensus among the stakeholders that how this can be fit into category of improved water within the premises which is new requirement of new SDGS signed by Pakistan.
3. The Government of Punjab should institutionalise mechanism for water quality testing closer to the community to create awareness about water quality and what kinds of arrangements can be in placed to acquire desired levels of water quality in the communities.

4. The WASH programmes/ partners should engage the literacy department and programmes to create awareness about improved sanitation, implications of open defecation and promotion of safe drinking water and hygiene practices as evident that mothers with no education have higher levels of open defecation, unimproved sanitation and low levels of hand washing with soap.
5. MICS 2014 data shows the trend that stunting is high in the population practicing open defecation and unimproved sanitation. An engagement of PATS provincial programme with provincial nutrition programme is desirable to enhance the impact and coverage.
6. The current MICS questionnaire, parts related to WASH, needs revision in light of newly signed SDGs as well as WASH Sector Plan 2014 2024. For example, the sanitation questions should provide information about carrier of sludge/human excreta along with onsite or off site treatments. Similarly, if we add filtration plants, then distance of filtration plants or time required for round trip in collection of water.

Annexures

Table 8: District Profile of Improved Water Wealth Quintile and Mother Education

	Overall	Wealth Quintile						Mother Education			
		1 st	2 nd	3 rd	4 th	5 th	None/ Pre- school	Primary	Middle	Second	Higher
Punjab	94.4	97.6	98.0	96.3	91.6	88.5	96.6	94.4	92.8	91.6	89.5
Urban	89.1	94.1	90.1	86.6	87.0	87.6	91.9	88.8	88.1	87.6	87.2
Rural	97.0	97.3	98.6	98.0	97.2	94.2	97.8	97.2	96.3	95.8	94.1
Faisalabad	69.8	96.5	80.4	68.7	54.8	48.6	78.9	71.0	64.6	59.9	58.1
Sialkot	87.8	99.7	93.8	87.1	82.6	75.9	93.5	91.8	85.4	84.1	78.1
DG Khan	90.3	86.1	97.0	98.7	92.4	77.0	92.7	80.3	91.8	85.6	79.8
Nankana Sahib	91.4	98.6	99.9	95.7	86.7	76.4	97.0	86.5	89.6	86.0	83.7
Sargodha	91.9	99.6	100.0	97.3	90.0	72.5	97.0	96.3	86.0	74.5	82.3
Khushab	92.6	86.5	94.9	95.7	98.8	87.3	92.1	98.8	80.9	96.9	89.4
RY Khan	92.7	96.2	99.0	96.9	97.3	74.3	97.3	87.1	83.8	78.2	72.2
Chakwal	93.6	89.0	91.7	96.9	92.8	97.6	96.5	93.6	91.7	89.5	91.7
Attock	94.1	86.9	90.6	93.6	100.0	99.4	93.0	89.5	99.0	98.0	100.0
Gujranwala	94.2	96.8	93.2	95.1	94.2	91.6	95.2	95.5	93.3	96.5	90.7
Rawalpindi	94.3	93.5	95.9	95.5	92.9	93.6	94.1	92.2	94.8	97.9	92.5
TT Singh	96.0	99.9	99.4	97.0	96.1	87.4	97.8	97.5	97.3	92.0	91.8
Mianwali	96.1	93.4	93.1	95.5	98.8	99.7	96.1	94.1	100.0	91.7	96.8
Sahiwal	96.3	100.0	98.6	99.4	97.2	86.3	99.5	96.3	97.7	95.3	82.8
Bahawalpur	96.5	96.4	97.7	98.7	97.4	92.2	96.9	96.9	96.9	96.0	93.3
Pakpattan	97.0	100.0	99.8	99.3	97.9	87.9	98.4	98.9	91.7	94.4	82.3
Sheikhupura	97.2	97.8	95.7	98.7	96.0	97.6	98.8	97.8	94.5	95.5	95.4
Hafizabad	97.4	100.0	98.6	98.7	98.3	91.7	98.3	100.0	94.2	91.2	95.0
Multan	97.5	97.6	97.7	98.9	97.8	95.6	98.3	97.0	97.8	97.2	95.2
Jhelum	97.5	92.1	97.6	99.6	99.8	98.5	95.5	97.8	100.0	97.6	100.0
Bahawalnagar	97.6	98.6	99.4	98.2	97.7	94.3	98.0	98.7	99.1	95.1	90.1
Okara	97.6	99.2	100.0	99.1	95.3	94.3	98.8	95.7	93.6	96.4	96.0
Rajanpur	98.1	94.8	98.3	100.0	97.9	99.2	97.8	100.0	100.0	95.8	100.0
Kasur	98.1	100.0	99.5	99.2	97.8	94.3	98.7	98.2	96.3	98.3	95.2
Lodhran	98.1	100.0	98.1	97.9	99.6	94.9	98.5	98.3	95.6	96.6	94.0
Muzaffargarh	98.2	98.3	98.7	99.1	99.7	95.1	98.6	99.3	97.8	96.7	89.9
Mandi Bahauddin	98.2	100.0	99.5	99.6	97.6	94.3	99.4	98.8	93.0	97.3	97.5
Lahore	98.5	99.8	99.2	99.0	97.8	96.5	100.0	98.3	99.1	98.9	96.5
Vehari	98.5	99.9	98.4	99.5	98.4	96.4	98.5	100.0	98.7	96.7	96.6
Chiniot	98.6	99.0	100.0	100.0	100.0	94.0	99.5	99.2	94.9	97.4	94.3
Khanewal	99.1	99.3	98.8	100.0	100.0	97.2	99.2	100.0	98.1	100.0	94.3
Jhang	99.2	100.0	98.1	99.4	99.7	98.9	99.4	99.1	98.9	96.6	99.2
Layyah	99.4	100.0	100.0	100.0	100.0	97.2	99.9	100.0	99.0	95.3	96.9
Gujrat	99.5	100.0	100.0	100.0	99.5	97.9	100.0	100.0	100.0	98.9	98.8
Narowal	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Bhakkar	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 9: Urban District Profile of Improved Water- Wealth Quintiles

District- Urban	Poorest	Second	Middle	Fourth	Richest	Total
Bahawalpur	97.9	94.5	94.2	92.5	82.0	92.2
Bahawalnagar	95.0	98.1	96.4	91.9	77.4	91.7
Rahim Yar Khan	84.6	84.7	66.6	63.9	57.5	71.4
Dera Ghazi Khan	94.2	83.0	83.7	58.2	71.7	78.1
Layyah	100.0	99.7	98.0	90.0	92.6	96.0
Muzaffargarh	100.0	97.7	97.1	93.7	76.0	92.9
Rajanpur	98.0	97.9	100.0	100.0	100.0	99.2
Faisalabad	64.3	60.9	37.5	47.5	43.1	50.6
Chiniot	98.3	100.0	99.0	93.8	85.4	95.3
Jhang	100.0	100.0	99.0	99.0	96.6	98.9
Toba Tek Singh	95.5	89.4	87.1	91.7	78.9	88.5
Gujranwala	95.3	96.6	94.8	95.3	89.6	94.3
Gujrat	100.0	100.0	97.8	97.9	93.8	97.9
Hafizabad	100.0	98.0	100.0	83.7	78.0	91.9
Mandi Bahauddin	97.5	95.9	93.3	86.1	83.1	91.2
Narowal	100.0	100.0	100.0	100.0	100.0	100.0
Sialkot	73.5	63.0	73.2	66.3	66.5	68.5
Lahore	98.9	99.2	96.0	94.8	78.8	93.5
Kasur	98.9	96.1	94.8	88.4	92.7	94.2
Nankana Sahib	93.5	88.4	69.6	75.7	63.4	78.0
Sheikhupura	91.9	99.2	96.9	96.8	84.1	93.8
Multan	98.6	100.0	97.2	98.8	91.5	97.2
Khanewal	98.0	100.0	100.0	98.7	86.5	96.6
Lodhran	100.0	100.0	94.1	84.5	87.0	93.1
Vehari	99.4	96.9	96.9	88.8	95.4	95.5
Sahiwal	96.1	93.5	91.8	84.0	66.9	86.4
Pakpattan	98.6	85.6	82.6	82.9	73.2	84.5
Okara	100.0	98.6	98.8	100.0	99.6	99.4
Rawalpindi	96.2	93.3	91.7	93.7	88.2	92.6
Attock	95.4	100.0	100.0	100.0	100.0	99.1
Chakwal	100.0	92.7	100.0	100.0	89.9	96.5
Jhelum	98.0	98.3	99.3	98.3	94.2	97.6
Sargodha	94.6	90.6	81.5	64.6	59.4	78.1
Bhakkar	100.0	100.0	100.0	100.0	100.0	100.0
Khushab	100.0	100.0	92.0	82.7	75.7	90.0
Mianwali	100.0	100.0	100.0	100.0	100.0	100.0

Table 10: Rural District Profile of Improved Water- Wealth Quintiles

District- Rural	Poorest	Second	Middle	Fourth	Richest	Total
Bahawalpur	96.2	98.7	97.0	97.7	100.0	97.9
Bahawalnagar	98.9	99.2	98.5	97.6	100.0	98.8
Rahim Yar Khan	95.1	99.7	100.0	98.0	98.2	98.2
Dera Ghazi Khan	71.7	94.2	98.2	98.7	87.2	90.0
Layyah	100.0	100.0	100.0	100.0	100.0	100.0
Muzaffargarh	98.0	99.5	99.0	99.0	100.0	99.1
Rajanpur	80.4	98.1	100.0	98.5	98.8	95.2
Faisalabad	98.3	95.5	87.5	78.2	73.0	86.5
Chiniot	99.2	100.0	100.0	100.0	100.0	99.8
Jhang	100.0	98.2	98.9	99.8	99.6	99.3
Toba Tek Singh	99.9	99.2	99.3	97.8	92.6	97.8
Gujranwala	98.4	96.6	90.1	93.0	92.2	94.1
Gujrat	100.0	100.0	100.0	100.0	99.5	99.9
Hafizabad	100.0	98.1	99.0	100.0	97.5	98.9
Mandi Bahauddin	100.0	99.4	100.0	98.1	99.0	99.3
Narowal	100.0	100.0	100.0	100.0	100.0	100.0
Sialkot	99.6	97.5	96.3	90.8	86.9	94.2
Lahore	100.0	100.0	99.2	100.0	94.4	98.7
Kasur	100.0	100.0	99.2	100.0	98.9	99.6
Nankana Sahib	98.2	100.0	98.2	93.2	86.6	95.2
Sheikhupura	98.4	98.0	97.3	98.7	95.4	97.6
Multan	99.4	96.2	97.6	99.0	95.2	97.5
Khanewal	99.2	98.9	100.0	100.0	99.5	99.5
Lodhran	100.0	97.8	99.5	98.0	99.5	99.0
Vehari	100.0	99.0	99.1	98.0	99.2	99.1
Sahiwal	100.0	100.0	97.8	100.0	93.3	98.2
Pakpattan	100.0	100.0	99.2	100.0	95.9	99.0
Okara	99.0	100.0	100.0	96.9	89.2	97.0
Rawalpindi	90.1	96.3	96.9	95.7	94.9	94.8
Attock	81.6	91.8	93.0	95.7	99.3	92.3
Chakwal	87.5	91.6	96.9	94.7	95.4	93.2
Jhelum	89.3	96.8	100.0	100.0	100.0	97.2
Sargodha	99.5	100.0	100.0	98.6	92.7	98.2
Bhakkar	100.0	100.0	100.0	100.0	100.0	100.0
Khushab	59.9	79.7	97.3	95.2	98.4	86.2
Mianwali	91.9	91.7	94.5	100.0	98.1	95.2

Table 11: Overall District Access to Piped Water Supply by Quintiles

District-Overall	Poorest	Second	Middle	Fourth	Richest	Total
Lahore	45.1	65.6	67.9	70.5	73.8	64.6
Bahawalnagar	10.9	31.9	48.6	53.1	64.9	41.9
Rawalpindi	17.2	28.3	39.8	37.4	52.0	34.9
Toba Tek Singh	16.5	25.7	30.4	31.6	42.7	29.4
Jhelum	27.2	31.3	28.0	27.7	12.3	25.3
Bahawalpur	7.8	11.9	20.4	35.5	48.1	24.8
Kasur	4.6	17.1	20.0	32.7	45.2	23.9
Chakwal	28.1	27.3	28.3	16.2	11.9	22.3
Khushab	0.4	10.2	19.9	44.9	34.0	21.9
Attock	9.6	17.8	27.0	23.2	30.8	21.7
Lodhran	9.4	16.2	22.1	20.9	24.0	18.6
Faisalabad	5.6	12.7	25.1	23.8	24.2	18.3
Dera Ghazi Khan	4.3	4.3	11.2	17.8	42.7	16.1
Multan	4.1	3.1	18.2	27.1	27.6	16.0
Mianwali	6.5	22.4	16.7	17.8	14.9	15.6
Vehari	7.2	8.6	15.6	13.3	27.7	14.5
Gujrat	6.4	11.0	15.5	19.5	19.2	14.3
Pakpattan	6.4	13.0	17.1	14.0	17.0	13.5
Sialkot	6.8	6.6	10.5	16.2	23.9	12.8
Gujranwala	4.6	10.8	10.3	17.1	13.3	11.2
Narowal	4.4	11.3	8.3	13.2	17.7	11.0
Nankana Sahib	6.5	9.8	9.4	13.2	14.5	10.7
Sheikhupura	5.6	6.6	6.5	9.7	19.3	9.6
Okara	5.8	4.2	7.4	13.7	16.2	9.5
Chiniot	1.8	7.4	3.3	5.2	23.6	8.3
Sargodha	1.1	0.9	4.6	7.6	21.4	7.1
Rahim Yar Khan	1.1	1.5	3.6	10.1	18.1	6.9
Sahiwal	1.2	3.2	6.5	12.7	11.1	6.9
Mandi Bahauddin	0.0	0.0	2.2	7.1	12.1	4.3
Hafizabad	0.0	1.4	3.2	11.3	4.4	4.1
Khanewal	0.8	1.5	1.0	3.7	8.0	3.0
Jhang	0.9	0.0	0.4	2.7	8.8	2.6
Rajanpur	1.4	0.5	2.8	4.5	2.8	2.4
Muzaffargarh	0.6	1.9	0.6	0.7	6.4	2.1
Layyah	0.0	1.2	0.2	1.1	2.1	0.9
Bhakkar	0.4	0.6	0.0	0.5	2.3	0.8

Table 12: Urban District Access to Piped Water Supply by Quintiles

District -Urban	Poorest	Second	Middle	Fourth	Richest	Total
Lahore	80.0	81.4	75.6	75.6	71.9	76.9
Bahawalnagar	40.3	76.0	64.3	71.4	55.9	61.6
Kasur	57.7	53.9	57.0	40.9	61.5	54.2
Dera Ghazi Khan	48.8	53.0	54.1	36.5	63.0	51.2
Rawalpindi	40.3	49.4	40.8	49.5	53.0	46.6
Toba Tek Singh	31.0	34.2	39.9	57.5	44.6	41.4
Bahawalpur	25.8	35.3	42.4	45.2	53.2	40.4
Pakpattan	57.6	42.7	36.1	32.7	20.9	38.0
Vehari	31.4	46.1	34.9	38.5	37.0	37.6
Jhelum	64.0	46.8	33.5	21.7	9.3	35.0
Attock	32.6	21.4	32.5	37.5	34.9	31.7
Gujrat	45.4	34.4	28.6	28.4	21.4	31.6
Multan	28.5	39.9	21.4	30.9	28.6	29.8
Khushab	28.9	30.9	35.2	22.6	24.8	28.5
Sialkot	21.2	26.1	32.6	19.3	38.9	27.6
Narowal	23.9	26.6	19.1	22.1	45.0	27.5
Faisalabad	26.1	39.2	18.2	20.1	28.3	26.3
Okara	15.3	27.7	25.5	12.6	34.6	23.2
Gujranwala	22.0	22.4	25.3	19.9	16.1	21.1
Chiniot	0.0	7.8	23.8	31.4	37.7	20.3
Sheikhupura	22.5	10.7	14.6	20.2	20.6	17.7
Chakwal	40.9	16.9	14.5	11.5	3.0	17.1
Sargodha	6.8	8.3	23.4	20.1	21.4	16.0
Rahim Yar Khan	8.6	12.1	22.8	19.2	16.9	15.9
Mianwali	8.1	19.6	23.4	14.4	10.4	15.2
Lodhran	10.6	7.2	19.0	22.8	12.2	14.3
Sahiwal	24.0	16.6	16.9	2.8	9.2	13.9
Jhang	10.3	9.2	15.6	15.5	14.5	13.1
Nankana Sahib	10.9	9.1	9.4	24.6	9.3	12.6
Mandi Bahauddin	5.2	9.7	15.1	10.5	8.1	9.7
Muzaffargarh	4.3	1.1	7.6	2.7	22.9	7.8
Khanewal	3.4	3.9	7.6	5.7	15.8	7.3
Hafizabad	4.6	8.9	5.3	3.3	5.6	5.6
Rajanpur	9.7	7.1	5.5	0.0	0.0	4.4
Layyah	0.0	0.0	2.4	5.6	6.5	2.9
Bhakkar	6.3	2.9	0.0	0.0	0.0	1.8

Table 13: Rural District Access to Piped Water Supply by Quintiles

District- Rural	Poorest	Second	Middle	Fourth	Richest	Total
Bahawalnagar	10.8	27.7	42.9	45.4	56.9	36.8
Toba Tek Singh	14.6	28.4	22.7	32.1	31.8	25.9
Chakwal	24.9	27.7	26.9	22.9	13.4	23.1
Jhelum	21.1	26.9	25.4	23.4	13.1	21.9
Rawalpindi	13.6	17.6	24.5	21.7	28.2	21.1
Khushab	0.5	0.5	15.1	24.0	57.0	19.5
Lodhran	8.1	16.5	20.2	25.1	26.7	19.3
Attock	11.1	12.8	16.9	29.7	20.9	18.3
Bahawalpur	6.2	12.3	12.7	17.4	39.4	17.6
Lahore	13.8	22.2	15.4	6.3	22.5	16.0
Mianwali	6.9	17.9	20.6	14.6	18.7	15.7
Kasur	3.2	10.9	6.5	12.4	23.0	11.2
Faisalabad	2.8	3.9	9.6	13.8	23.8	10.8
Nankana Sahib	5.1	11.9	9.0	10.4	14.1	10.1
Vehari	6.9	6.0	14.1	7.7	15.8	10.1
Pakpattan	3.6	11.3	14.0	13.0	5.2	9.4
Gujrat	3.5	5.4	9.5	10.1	16.1	8.9
Dera Ghazi Khan	4.4	2.9	6.8	6.8	19.7	8.1
Narowal	3.8	7.3	13.0	6.3	9.7	8.0
Multan	3.5	2.5	2.2	11.5	19.4	7.8
Sialkot	4.9	6.9	5.3	6.2	14.3	7.5
Sahiwal	1.5	0.6	5.5	9.3	11.0	5.6
Sheikhupura	2.4	3.8	5.4	1.7	11.9	5.0
Okara	4.5	4.4	6.6	5.1	3.6	4.8
Rahim Yar Khan	1.4	0.8	2.2	4.8	12.9	4.4
Hafizabad	0.0	0.0	0.0	15.1	2.7	3.6
Chiniot	2.2	5.3	6.9	2.5	0.0	3.4
Mandi Bahauddin	0.0	0.0	0.6	3.7	12.1	3.3
Sargodha	0.3	1.3	1.5	3.0	7.7	2.8
Rajanpur	0.0	0.9	1.3	5.7	2.4	2.1
Khanewal	0.9	1.2	1.2	2.9	4.1	2.0
Muzaffargarh	0.5	0.0	2.3	0.7	1.7	1.1
Gujranwala	0.1	1.2	2.1	0.0	0.0	0.7
Layyah	0.0	1.5	0.3	0.6	0.6	0.6
Bhakkar	0.0	0.0	0.0	0.0	2.7	0.5
Jhang	0.0	0.0	0.0	0.0	0.0	0.0

Table 14: Access to Improved Sanitation by Quintiles and Mothers Education

Region/ Districts	Overall	Wealth Quintile					Mother Education				
		1 st	2 nd	3 rd	4 th	5 th	None/ Pre- school	Primary	Middle	Matric	Higher
Punjab	75.1	24.7	71.9	88.9	92.9	97.3	60.8	82.7	89.0	94.1	95.7
Urban	92.1	80.0	90.8	94.4	96.6	98.9	86.2	90.9	93.2	95.8	97.1
Rural	66.8	16.2	52.9	79.8	90.0	95.0	54.8	78.6	85.9	92.3	93.1
Khanewal	45.7	15.0	39.7	54.6	58.1	60.7	40.7	50.7	62.4	54.6	67.5
Rajanpur	49.6	2.3	22.4	45.8	79.3	97.8	41.2	80.1	81.4	95.4	100.0
Jhang	51.3	2.5	14.7	64.4	87.5	86.7	42.0	63.2	83.7	79.9	75.4
Vehari	51.8	21.1	43.9	61.6	55.2	77.1	43.7	53.7	66.2	67.2	68.4
Multan	52.3	9.4	38.3	58.2	68.3	87.2	40.7	48.2	66.5	80.4	77.5
Lodhran	54.3	12.7	35.8	62.1	74.3	86.6	47.6	65.4	73.3	86.7	88.6
Muzaffargarh	54.8	6.8	24.1	54.6	91.0	97.3	45.3	77.2	85.5	90.0	94.6
DG Khan	56.4	4.6	32.4	60.1	85.3	99.4	45.1	76.5	86.4	100.0	92.7
Bahawalnagar	57.3	10.9	41.5	68.2	83.1	82.5	45.5	74.9	75.3	89.1	95.4
Chiniot	58.8	3.6	27.2	69.6	97.2	96.0	44.0	81.5	86.7	94.6	91.1
RY Khan	59.1	16.1	44.4	65.8	82.7	86.5	50.6	73.3	77.7	84.1	96.5
Bahawalpur	62.8	8.6	50.4	78.8	81.1	95.3	51.8	79.3	84.5	88.4	90.7
Khushab	64.5	8.8	38.0	77.3	97.8	100.0	53.2	72.2	80.7	95.8	97.4
Okara	67.4	16.7	59.9	82.7	84.5	93.3	57.3	74.5	81.7	88.8	89.6
Kasur	68.6	32.4	72.0	80.2	81.9	76.2	60.9	79.8	74.1	83.8	79.9
Bhakkar	68.8	11.5	50.8	88.0	93.5	100.0	58.1	88.3	97.7	100.0	100.0
Layyah	69.1	15.2	53.4	79.5	97.2	99.7	59.6	81.7	84.1	98.4	99.5
Pakpattan	71.5	27.0	67.1	83.5	89.4	89.9	64.2	79.7	92.6	93.4	93.0
Mandi Bahauddin	75.6	15.3	74.4	93.4	97.0	97.5	61.4	76.7	88.5	90.4	99.4
Sargodha	76.8	18.3	72.0	96.4	97.7	99.3	60.5	84.9	94.3	96.9	98.9
Sahiwal	77.3	27.4	68.5	94.0	98.2	98.5	61.8	83.8	93.5	96.8	98.7
Narowal	78.3	26.7	79.4	89.1	96.3	99.6	67.7	82.5	74.4	94.1	98.2
Hafizabad	80.0	28.3	74.7	97.2	99.0	100.0	68.2	84.1	99.0	100.0	100.0
TT Singh	80.5	31.4	84.3	94.7	96.5	95.4	67.8	84.7	96.7	91.2	91.5
Attock	81.8	38.9	82.6	92.3	97.7	97.1	73.2	84.3	90.0	91.9	99.5
Chakwal	83.1	41.7	82.3	96.7	98.0	96.5	70.9	80.7	86.0	90.6	97.3
Jhelum	83.4	31.3	92.9	97.7	98.7	96.2	69.7	83.7	92.9	93.9	100.0
Mianwali	85.5	41.2	89.5	96.9	100.0	100.0	79.7	86.8	91.3	100.0	100.0
Nankana Sahib	89.2	54.4	94.8	98.2	98.8	99.6	81.5	93.7	99.6	97.1	100.0
Rawalpindi	91.4	66.2	95.9	97.1	98.6	99.3	83.1	86.7	93.1	96.9	98.2
Sheikhupura	91.9	72.6	93.7	97.3	98.0	98.1	87.1	96.9	94.7	98.4	96.9
Faisalabad	92.0	65.7	98.9	97.4	98.4	99.6	84.9	93.6	97.0	99.9	99.5
Sialkot	92.7	72.1	96.9	97.5	97.6	99.4	86.5	92.6	94.3	98.6	98.1
Gujrat	92.9	68.7	98.6	98.6	98.8	100.0	86.0	90.6	94.9	96.0	100.0
Gujranwala	96.0	89.5	98.5	97.8	95.0	99.3	94.7	97.9	96.0	97.0	97.9
Lahore	96.9	88.5	98.4	98.4	99.6	99.3	92.2	96.5	97.3	99.2	99.1

Table 15: Urban District Access to Improved Sanitation by Quintiles

District- Urban	Lowest	Second	Middle	Fourth	Highest	Total-%
Khanewal	16.9	55.5	53.1	50.7	75.5	50.4
Kasur	40.5	52.3	56.9	61.6	81.1	58.5
Bahawalnagar	52.1	55.6	66.2	76.5	85.2	67.2
Multan	64.1	63.5	74.1	84.6	91.4	75.6
Okara	53.7	79.0	76.3	87.8	100.0	79.4
Vehari	60.2	82.3	78.6	90.1	91.9	80.6
Lodhran	65.3	73.2	82.7	94.6	92.3	81.7
Jhang	68.0	84.8	82.7	87.8	93.7	83.4
Muzaffargarh	37.2	96.0	93.1	96.2	100.0	84.8
Pakpattan	75.8	83.6	90.2	81.0	93.4	84.8
Bahawalpur	67.4	83.4	91.3	97.4	100.0	88.0
Chakwal	69.5	92.1	97.0	97.6	92.2	89.9
Chiniot	77.1	94.8	96.9	94.3	92.0	91.1
Bhakkar	65.4	93.2	97.3	100.0	100.0	91.3
Nankana Sahib	71.7	94.5	100.0	98.1	100.0	92.9
Rajanpur	74.4	93.8	98.3	100.0	100.0	93.4
Mandi Bahauddin	79.2	95.7	100.0	94.9	98.3	93.6
Attock	90.4	92.7	96.6	98.7	93.2	94.3
Rahim Yar Khan	78.4	96.7	100.0	97.2	100.0	94.5
Toba Tek Singh	92.4	94.2	97.1	93.1	97.6	94.9
Sheikhupura	85.6	98.6	97.1	95.1	100.0	95.3
Jhelum	78.9	100.0	97.6	100.0	100.0	95.3
Sargodha	86.3	95.8	98.4	98.7	100.0	95.9
Mianwali	79.9	100.0	100.0	100.0	100.0	96.0
Gujranwala	94.8	98.0	92.8	97.0	98.6	96.2
Rawalpindi	88.0	97.8	97.8	98.4	100.0	96.4
Narowal	93.4	93.8	98.1	97.6	100.0	96.6
Gujrat	90.1	95.8	97.7	100.0	100.0	96.7
Khushab	86.5	99.0	100.0	100.0	100.0	97.2
Faisalabad	97.8	94.4	98.1	99.0	99.5	97.8
Hafizabad	90.7	100.0	100.0	98.0	100.0	97.8
Dera Ghazi Khan	91.8	98.1	100.0	100.0	100.0	98.0
Sahiwal	90.5	100.0	100.0	100.0	100.0	98.1
Layyah	94.3	100.0	100.0	98.1	100.0	98.5
Sialkot	96.8	97.7	98.5	99.4	100.0	98.5
Lahore	96.8	98.7	99.7	99.7	99.2	98.8

Table 16: Rural District Access to Improved Sanitation by Quintiles

District- Rural	Lowest	Second	Middle	Fourth	Highest	Total-%
Multan	5.3	23.6	36.5	54.7	71.5	38.4
Rajanpur	1.0	16.0	36.1	65.6	92.9	42.5
Jhang	1.5	8.2	44.4	72.0	90.4	43.4
Khanewal	11.5	33.4	55.4	59.6	62.8	44.6
Chiniot	0.0	10.4	38.7	78.8	99.2	45.5
Vehari	20.1	42.4	51.6	62.0	55.5	46.3
Dera Ghazi Khan	1.9	26.8	43.0	70.9	92.1	47.0
Lodhran	9.6	31.0	50.2	76.8	78.3	49.2
Rahim Yar Khan	13.4	40.4	48.5	74.0	70.8	49.5
Muzaffargarh	5.3	21.2	43.5	82.4	95.4	49.6
Bahawalpur	6.8	23.9	69.8	78.1	78.4	51.4
Khushab	7.9	18.1	56.8	79.5	100.0	52.6
Bahawalnagar	7.3	28.6	61.8	82.2	93.4	54.7
Okara	15.5	44.9	75.3	86.7	94.5	63.4
Layyah	12.4	42.2	71.0	95.1	99.2	64.1
Bhakkar	11.3	39.1	79.4	92.7	99.2	64.4
Sargodha	8.5	47.8	81.4	99.6	99.3	67.4
Pakpattan	21.4	67.2	73.9	89.9	93.6	69.2
Mandi Bahauddin	10.5	64.6	91.5	96.4	98.3	72.4
Kasur	25.7	67.0	82.7	91.5	97.1	72.9
Sahiwal	21.4	61.2	90.9	94.7	97.8	73.3
Hafizabad	17.8	57.4	92.8	99.1	100.0	73.6
Narowal	18.8	75.3	84.5	96.0	100.0	75.0
Toba Tek Singh	24.4	73.3	92.4	95.6	95.8	76.3
Attock	29.2	76.4	86.4	95.6	100.0	77.6
Jhelum	22.1	84.6	95.3	98.5	95.5	79.2
Chakwal	38.2	79.9	96.3	98.8	97.3	82.1
Mianwali	37.2	82.8	95.7	100.0	100.0	83.2
Rawalpindi	45.0	87.7	96.6	98.4	100.0	85.6
Faisalabad	44.5	89.1	100.0	99.5	100.0	86.6
Nankana Sahib	51.1	91.4	97.7	100.0	100.0	88.1
Lahore	67.4	92.4	90.6	98.9	96.6	89.2
Sheikhupura	64.0	91.3	97.1	99.7	98.2	90.1
Sialkot	65.4	93.9	97.1	99.2	97.7	90.7
Gujrat	60.6	98.6	100.0	99.4	100.0	91.8
Gujranwala	83.2	99.7	97.9	98.9	99.2	95.8

Table 17: Open Defecation by Quintiles and Mothers Education

Region/Districts	Overall	Wealth Quintile					Mother Education				
		1 st	2 nd	3 rd	4 th	5 th	None	Primary	Middle	Matric	Higher
Punjab	17.5	69.4	16.4	1.4	0.1	0.0	30.7	9.3	4.0	1.2	0.4
Urban	1.2	5.9	0.4	0.0	0.0	0.0	3.7	1.0	0.1	0.1	0.0
Rural	25.4	80.3	36.6	9.0	1.2	0.0	37.0	13.4	6.9	2.4	1.3
Rajanpur	49.4	97.7	76.4	53.6	17.8	1.9	58.2	18.7	18.6	4.6	0.0
Muzaffargarh	42.8	93.2	74.5	40.5	6.1	0.0	52.1	19.7	14.5	6.1	5.4
Chiniot	39.2	95.6	72.8	27.3	0.8	0.0	55.2	16.1	4.6	2.8	4.1
DG Khan	38.6	93.1	62.9	30.6	6.3	0.2	50.1	17.5	6.0	0.0	0.0
Jhang	38.3	96.2	73.5	18.1	3.6	0.5	49.3	27.9	2.3	3.1	7.0
Khushab	34.9	91.2	62.0	20.8	0.9	0.0	46.8	25.5	15.5	4.2	2.6
Bhakkar	30.9	88.5	48.7	12.0	5.6	0.0	41.4	11.7	2.3	0.0	0.0
Bahawalnagar	30.6	88.3	48.3	14.0	2.7	0.0	44.6	8.9	1.8	0.0	0.0
Lodhran	29.7	77.5	46.6	23.1	1.2	0.0	37.3	11.8	2.4	2.5	0.0
RY Khan	29.6	82.1	44.2	19.9	1.5	0.0	39.6	8.6	4.2	0.0	0.0
Layyah	29.1	84.5	45.0	14.9	1.5	0.0	38.8	14.8	15.9	1.0	0.0
Bahawalpur	26.0	88.7	36.8	4.4	0.0	0.4	36.9	14.5	0.0	1.1	0.0
Okara	22.9	80.4	31.4	3.0	0.0	0.0	33.4	13.1	3.4	1.3	4.4
Sargodha	22.3	81.3	26.7	3.5	0.3	0.0	38.5	14.4	5.7	1.0	0.0
M. Bahaiddin	21.5	83.5	20.6	4.0	0.0	0.0	36.1	17.8	8.8	6.7	0.0
Sahiwal	20.1	71.6	27.1	2.0	0.0	0.0	35.6	14.0	3.7	0.0	0.0
Narowal	19.7	71.9	14.7	10.7	1.4	0.0	29.7	16.7	21.7	2.8	1.8
Multan	19.6	73.5	23.4	1.4	0.0	0.0	32.1	11.1	3.7	0.0	0.0
Khanewal	19.3	70.6	23.1	3.0	0.0	0.0	25.8	9.2	8.0	2.3	0.0
Hafizabad	18.8	69.4	22.3	2.8	0.0	0.0	29.7	15.1	0.0	0.0	0.0
Pakpattan	17.0	66.8	13.3	5.0	0.0	0.0	22.8	9.3	4.1	0.0	0.0
Vehari	15.9	59.5	16.8	3.2	0.0	0.0	25.5	4.5	5.7	0.0	0.0
Jhelum	15.2	66.5	6.2	2.3	1.1	0.0	28.5	15.5	7.1	5.5	0.0
Attock	15.0	60.0	13.0	2.3	0.0	0.0	23.8	10.9	7.6	3.3	0.0
TT Singh	14.6	65.9	6.6	0.8	0.0	0.0	27.8	8.7	1.7	3.9	0.0
Chakwal	14.6	55.0	15.3	2.3	0.7	0.0	26.5	17.1	10.0	6.0	0.7
Mianwali	14.0	58.8	8.2	3.1	0.0	0.0	20.1	13.2	3.4	0.0	0.0
Kasur	9.9	44.0	5.9	0.0	0.0	0.0	15.2	1.4	3.7	4.0	0.0
Nankana Sahib	9.0	42.0	3.1	0.0	0.0	0.0	15.8	6.0	0.0	0.0	0.0
Faisalabad	6.9	33.0	0.1	1.4	0.0	0.0	13.7	5.0	1.3	0.0	0.0
Rawalpindi	6.5	32.1	0.4	0.0	0.0	0.0	14.2	11.4	5.8	1.5	0.0
Gujrat	5.8	28.8	0.0	0.0	0.0	0.0	11.2	8.3	2.9	3.0	0.0
Sheikhupura	4.8	21.3	1.9	0.7	0.0	0.0	8.6	1.7	2.0	0.0	0.7
Sialkot	4.7	21.4	2.2	0.0	0.0	0.0	11.3	3.1	2.6	0.0	1.0
Gujranwala	1.3	6.4	0.1	0.0	0.0	0.0	3.6	0.2	0.2	0.0	0.0
Lahore	0.5	2.6	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0

Table 18: Urban District Open Defecation by Quintiles

District- Urban	Poorest	Second	Middle	Fourth	Richest	Total
Muzaffargarh	61.8	1.9	0.0	0.0	0.0	12.4
Bhakkar	32.8	3.7	0.0	0.0	0.0	7.2
Bahawalpur	21.0	0.0	0.0	1.3	0.0	4.4
Nankana Sahib	22.5	0.0	0.0	0.0	0.0	4.4
Chakwal	22.2	0.0	0.0	0.0	0.0	4.3
Chiniot	21.2	0.0	0.0	0.0	0.0	4.2
Rajanpur	19.7	1.0	0.0	0.0	0.0	4.0
Jhang	20.2	0.0	0.0	0.0	0.0	4.0
Mandi Bahauddin	19.8	0.7	0.0	0.0	0.0	4.0
Mianwali	20.1	0.0	0.0	0.0	0.0	4.0
Jhelum	17.6	0.0	0.0	0.0	0.0	3.5
Vehari	14.4	0.0	0.0	0.0	0.0	2.9
Sargodha	13.4	0.0	0.0	0.0	0.0	2.7
Khushab	13.5	0.0	0.0	0.0	0.0	2.7
Bahawalnagar	12.7	0.0	0.0	0.0	0.0	2.5
Rahim Yar Khan	10.1	0.0	0.0	0.0	0.0	2.0
Hafizabad	7.2	0.0	0.0	0.0	0.0	1.4
Khanewal	6.0	0.0	0.0	0.0	0.0	1.2
Lodhran	6.0	0.0	0.0	0.0	0.0	1.2
Okara	6.0	0.0	0.0	0.0	0.0	1.2
Layyah	5.7	0.0	0.0	0.0	0.0	1.1
Sheikhupura	3.1	1.4	0.0	0.0	0.0	0.9
Pakpattan	4.7	0.0	0.0	0.0	0.0	0.9
Attock	4.4	0.0	0.0	0.0	0.0	0.9
Faisalabad	0.9	2.9	0.0	0.0	0.0	0.8
Rawalpindi	3.8	0.0	0.0	0.0	0.0	0.7
Dera Ghazi Khan	3.0	0.0	0.0	0.0	0.0	0.6
Multan	2.4	0.0	0.0	0.0	0.0	0.5
Sahiwal	1.9	0.0	0.0	0.0	0.0	0.4
Gujrat	1.5	0.0	0.0	0.0	0.0	0.3
Toba Tek Singh	1.1	0.0	0.0	0.0	0.0	0.2
Narowal	1.2	0.0	0.0	0.0	0.0	0.2
Gujranwala	0.1	0.0	0.0	0.0	0.0	0.0
Sialkot	0.0	0.0	0.0	0.0	0.0	0.0
Lahore	0.0	0.0	0.0	0.0	0.0	0.0
Kasur	0.0	0.0	0.0	0.0	0.0	0.0

Table 19: Rural District Open Defecation by Quintiles

District - Rural	Poorest	Second	Middle	Fourth	Richest	Total
Rajanpur	99.0	83.1	63.9	31.9	6.7	56.8
Chiniot	99.0	89.6	61.3	18.7	0.0	53.6
Muzaffargarh	94.7	78.6	49.5	16.8	1.1	48.1
Dera Ghazi Khan	96.3	68.7	47.4	21.3	2.7	47.2
Jhang	98.5	85.1	37.0	12.7	0.7	46.7
Khushab	92.1	81.9	40.5	19.2	0.0	46.7
Bahawalnagar	92.2	64.5	25.0	8.5	0.0	38.0
Rahim Yar Khan	84.4	51.0	39.8	10.0	0.3	37.0
Bahawalpur	92.3	65.3	19.7	2.3	0.0	35.9
Bhakkar	88.7	60.6	20.6	7.3	0.8	35.5
Lodhran	81.8	57.0	30.7	5.7	0.0	35.0
Layyah	87.2	56.6	21.8	4.1	0.0	33.8
Sargodha	90.9	51.8	17.1	0.4	0.0	32.0
Multan	87.2	45.2	21.1	2.2	0.0	31.0
Okara	82.5	51.2	16.2	1.4	0.0	30.2
Hafizabad	79.1	39.5	6.9	0.3	0.0	25.0
Mandi Bahauddin	88.1	30.8	5.1	0.0	0.0	24.7
Sahiwal	77.9	35.6	5.4	1.1	0.0	24.0
Khanewal	77.0	32.3	7.1	1.0	0.0	23.4
Narowal	79.9	20.2	13.2	2.8	0.0	23.2
Pakpattan	72.6	16.8	9.0	0.0	0.0	19.7
Attock	69.4	23.6	5.1	1.0	0.0	19.7
Jhelum	75.5	14.9	4.7	1.5	0.0	19.3
Toba Tek Singh	74.9	17.0	2.3	0.0	0.0	18.8
Vehari	62.4	22.3	6.3	1.0	0.0	18.3
Mianwali	62.8	14.5	4.3	0.0	0.0	16.3
Chakwal	58.6	17.6	3.7	0.8	0.0	16.1
Kasur	55.4	10.9	4.2	0.0	0.0	14.0
Rawalpindi	53.7	12.0	0.8	0.0	0.0	13.3
Faisalabad	53.3	9.5	0.0	0.0	0.0	12.5
Nankana Sahib	46.8	5.0	0.0	0.0	0.0	10.3
Gujrat	36.9	0.6	0.0	0.0	0.0	7.5
Sheikhupura	30.2	3.2	1.0	0.3	0.0	6.9
Sialkot	27.3	4.7	0.0	0.0	0.0	6.4
Gujranwala	13.0	0.3	0.0	0.0	0.0	2.7
Lahore	12.8	0.0	0.0	0.0	0.0	2.6

Table 20: Hand Washing with Water & Soap by Quintiles and Mothers Education

	Overall	Wealth Quintile						Mother Education			
		1 st	2 nd	3 rd	4 th	5 th	None	Primary	Middle	Matric	Higher
Punjab	78.1	40.5	74.0	89.1	91.6	95.1	66.7	85.0	88.7	92.7	93.7
Urban	90.5	79.7	89.8	93.0	95.1	94.6	85.6	90.4	91.8	93.8	93.9
Rural	72.0	33.7	61.5	80.8	90.4	93.6	62.3	82.3	86.3	91.5	93.5
DG Khan	44.2	6.2	19.3	42.2	67.8	85.4	33.7	58.6	77.5	86.1	84.7
Rajanpur	44.4	7.2	24.0	45.8	51.6	93.0	36.4	64.5	100.0	90.1	100.0
Muzaffargarh	55.7	24.8	31.7	53.2	75.2	93.7	48.3	67.5	77.8	87.2	89.9
Bhakkar	59.4	32.2	34.1	60.5	78.4	91.8	50.4	77.2	82.7	92.3	85.6
RY Khan	61.3	22.1	39.5	66.1	81.1	97.4	51.0	88.6	85.8	93.1	94.3
Khushab	62.8	22.2	52.6	67.2	78.6	92.8	52.6	70.1	95.1	85.0	93.6
Mianwali	62.9	38.2	46.9	60.4	83.9	85.0	54.2	67.9	72.7	73.9	81.0
Bahawalpur	63.1	25.8	40.4	66.5	89.7	92.7	51.2	76.5	89.6	93.0	93.4
Layyah	66.5	31.7	56.2	66.9	82.9	94.5	58.3	76.6	84.9	90.7	98.6
Bahawalnagar	67.5	31.1	57.3	70.6	83.0	95.2	58.0	86.1	80.9	92.6	91.0
Lodhran	68.1	32.1	51.4	71.1	86.0	99.6	62.6	75.0	90.2	86.4	100.0
Khanewal	71.7	30.9	62.1	82.8	89.6	93.2	64.1	81.7	87.2	95.2	91.2
Multan	72.1	29.3	63.1	82.7	89.5	95.5	61.7	73.2	83.5	95.9	95.3
Jhang	73.6	48.4	56.3	78.9	89.8	94.5	67.2	86.8	84.3	92.4	88.3
Chiniot	74.6	41.9	59.3	81.4	94.5	95.8	65.0	84.8	98.4	100.0	95.9
Kasur	76.7	48.6	72.1	82.7	85.4	94.4	69.4	81.1	91.0	90.8	85.9
Vehari	76.8	36.3	73.1	85.1	90.5	99.1	68.8	82.1	85.0	89.4	100.0
Sargodha	78.3	54.8	72.3	82.8	87.7	93.6	71.2	84.6	82.4	88.0	93.7
Rawalpindi	78.4	54.3	84.4	96.0	98.0	98.5	70.5	79.4	72.7	81.1	86.5
TT Singh	79.1	45.8	73.7	87.4	91.4	97.2	66.5	85.1	88.7	91.5	97.4
Okara	81.8	66.6	84.6	91.7	95.8	98.1	73.4	89.2	92.3	93.5	97.3
Pakpattan	84.5	71.0	93.1	95.1	96.9	95.5	79.0	89.7	94.6	94.8	100.0
Attock	86.1	58.1	82.2	87.9	97.9	96.0	82.0	90.3	89.8	93.8	91.8
Sahiwal	86.2	67.2	83.6	90.4	93.2	95.8	79.8	89.0	96.1	97.4	97.7
Narowal	87.1	65.2	82.0	92.5	95.6	99.9	81.3	89.1	90.9	95.6	97.1
Nankana Sahib	87.1	70.1	87.0	91.0	90.4	96.7	83.4	90.7	80.4	97.4	93.0
Chakwal	87.4	55.9	76.0	89.3	92.8	95.0	80.1	85.6	85.2	94.5	99.1
Hafizabad	87.7	74.7	86.2	89.1	91.3	97.1	85.2	89.5	90.4	96.8	100.0
Sialkot	88.6	80.9	92.8	85.6	89.9	94.0	86.4	89.3	88.8	89.8	93.1
M. Bahauddin	89.1	73.3	86.0	93.8	94.3	98.1	83.5	89.4	93.9	97.0	96.5
Gujranwala	90.3	78.2	92.7	91.2	94.4	94.7	87.1	89.5	93.0	91.1	95.6
Jhelum	90.3	60.3	75.6	84.0	86.0	85.8	84.6	91.3	89.9	97.6	95.7
Faisalabad	91.1	77.0	92.0	94.8	94.2	97.3	86.2	91.0	92.7	98.3	96.2
Sheikhupura	91.5	81.0	93.1	94.8	91.0	97.3	90.4	93.4	93.8	95.2	91.0
Gujrat	93.2	88.2	85.7	96.7	98.1	97.1	93.1	88.6	96.4	95.3	98.0
Lahore	93.5	87.5	93.3	96.6	95.0	94.8	91.1	90.7	95.1	95.4	95.4

Table 21: Urban District Hand Washing by Quintiles

District- Urban	Poorest	Second	Middle	Fourth	Richest	Total
Bahawalpur	58.6	86.7	84.8	94.3	95.2	84.0
Bahawalnagar	69.2	82.1	95.1	97.6	97.8	88.4
Rahim Yar Khan	65.3	88.6	98.2	100.0	100.0	90.4
Dera Ghazi Khan	47.4	91.3	57.9	85.5	100.0	76.5
Layyah	62.3	97.8	81.8	99.2	97.8	88.1
Muzaffargarh	42.4	83.9	93.0	94.7	97.0	82.5
Rajanpur	61.8	68.3	84.0	96.8	100.0	82.3
Faisalabad	89.8	91.5	94.6	97.0	97.8	94.2
Chiniot	65.1	94.4	92.2	100.0	97.8	90.0
Jhang	57.1	79.2	87.9	92.5	95.0	82.4
Toba Tek Singh	83.6	91.3	92.6	95.0	100.0	92.5
Gujranwala	88.2	90.7	92.7	96.0	92.5	92.0
Gujrat	83.4	97.5	95.1	98.0	94.4	93.7
Hafizabad	82.6	87.0	93.1	90.8	94.4	89.6
Mandi Bahauddin	84.7	98.3	88.3	99.3	98.0	93.8
Narowal	83.4	98.1	98.6	100.0	100.0	96.1
Sialkot	80.6	84.7	85.3	94.7	87.5	86.6
Lahore	92.2	96.1	97.3	96.2	94.2	95.2
Kasur	74.1	82.9	85.2	95.8	99.2	87.5
Nankana Sahib	88.0	90.9	97.6	98.2	93.7	93.7
Sheikhupura	91.2	96.5	88.2	96.0	96.5	93.6
Multan	78.0	87.7	87.5	93.7	95.9	88.6
Khanewal	75.1	94.0	95.6	97.8	98.1	92.2
Lodhran	72.0	87.9	97.4	100.0	100.0	91.5
Vehari	71.0	91.4	95.5	98.9	100.0	91.4
Sahiwal	88.4	96.1	97.8	95.4	98.2	95.2
Pakpattan	94.1	94.1	89.3	96.1	97.6	94.3
Okara	87.7	90.3	93.6	95.6	97.4	92.9
Rawalpindi	70.5	81.5	82.9	85.6	88.3	81.8
Attock	82.6	93.5	89.7	97.2	95.2	91.7
Chakwal	72.2	92.9	95.8	100.0	98.3	92.0
Jhelum	92.3	92.5	97.2	88.8	94.5	93.1
Sargodha	70.8	86.8	86.1	93.9	97.0	87.0
Bhakkar	43.5	81.0	90.3	90.5	96.6	80.5
Khushab	59.9	62.6	91.9	98.4	94.7	81.7
Mianwali	54.7	82.1	84.7	83.3	85.4	78.1

Table 22: Rural District Hand Washing by Quintiles

District - Rural	Poorest	Second	Middle	Fourth	Richest	Total
Bahawalpur	22.7	31.6	49.4	69.1	94.5	53.5
Bahawalnagar	30.1	50.2	65.4	75.5	88.5	62.0
Rahim Yar Khan	20.9	36.6	48.9	71.5	88.5	53.4
Dera Ghazi Khan	6.4	13.2	37.2	45.1	82.1	36.9
Layyah	29.5	54.8	62.7	73.3	93.5	62.8
Muzaffargarh	25.6	29.2	44.6	69.7	86.2	51.1
Rajanpur	6.1	20.5	41.6	45.0	77.6	38.3
Faisalabad	69.2	85.9	93.9	94.9	96.8	88.2
Chiniot	40.7	55.2	65.2	87.4	92.6	68.3
Jhang	49.8	46.7	75.4	88.1	97.2	71.5
Toba Tek Singh	43.1	59.5	88.6	86.6	98.3	75.3
Gujranwala	73.4	88.8	91.1	90.7	97.6	88.3
Gujrat	87.8	89.7	90.5	98.3	98.6	93.0
Hafizabad	74.5	82.6	88.9	93.9	95.2	87.0
Mandi Bahauddin	72.7	85.1	91.2	92.8	99.5	88.3
Narowal	64.1	78.3	91.5	93.8	99.3	85.5
Sialkot	78.4	94.6	88.2	89.0	96.7	89.4
Lahore	78.9	89.2	80.3	94.4	90.1	86.6
Kasur	44.1	66.8	75.4	84.8	89.8	72.2
Nankana Sahib	69.8	81.0	90.7	87.3	96.6	85.1
Sheikhupura	74.5	94.0	92.6	93.4	96.6	90.2
Multan	19.9	51.3	65.8	79.5	94.2	62.2
Khanewal	29.0	58.7	70.3	87.6	89.4	67.0
Lodhran	28.8	43.7	68.9	79.9	97.0	63.7
Vehari	36.3	65.2	82.3	92.1	94.1	74.1
Sahiwal	52.8	76.3	95.0	98.3	100.0	84.5
Pakpattan	56.0	77.4	87.9	94.6	98.1	82.8
Okara	56.7	68.0	76.7	92.7	95.9	78.0
Rawalpindi	52.7	66.1	78.7	85.2	88.7	74.3
Attock	68.2	76.2	87.9	89.7	98.8	84.2
Chakwal	69.5	81.4	87.7	97.4	97.5	86.7
Jhelum	67.0	88.9	95.0	98.9	97.0	89.4
Sargodha	46.0	69.9	79.4	86.1	88.5	74.0
Bhakkar	33.7	32.4	48.4	70.0	91.4	55.3
Khushab	24.7	38.9	55.1	75.3	84.8	55.8
Mianwali	34.8	45.0	61.9	69.8	85.7	59.5