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Water and sanitation 2002–2010
In-depth analysis of the General Household Survey data

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Glossary of abbreviations

DWA	Department of Water Affairs
FBW	Free Basic Services
GHS	General Household Survey
JMP	Joint Monitoring Programme
M	Metre
MDG	Millennium Development Goals
RDP	Reconstruction and Development Programme
TBVC	Transkei, Bophuthatswana, Venda and Ciskei
UN	United Nations
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Glossary of concepts

Safe water sources	Boreholes, piped or tap water in the dwelling, on-site or off-site.
Sanitation at RDP standard	Flush toilet with on-site or off-site disposal as well as pit latrine with ventilation pipe regardless of location.
Unsafe water sources	Dams, wells, springs, rivers and streams.
Other water sources	Rain-water tank, water-carrier/ tanker.
Water at RDP standard	Water sources from pipes/tap/boreholes in the dwelling or yard or 200 metres or less from the dwelling.

1. Introduction

One of the human rights of every South African is the right of access to basic water and basic sanitation (Water Services Act, No. 108 of 1997). The South African government has been working towards universal access to safe water and basic sanitation by 2014. The three fundamental objectives for managing South Africa's water resources are: equitable access to water services; sustainable use of water and efficient and effective water use. Not only is access to safe water and basic sanitation a basic right, it also forms part of the seventh Millennium Development Goal (MDG) aimed at ensuring environmental sustainability. The United Nations Secretary-General's Advisory Board on Water and Sanitation, states that sub-Saharan Africa appears unlikely to meet any of the MDG targets for water and sanitation. Too many children still die from the complications of diarrhoea resulting from poor water quality and unsafe sanitation practices and too many girls and women spend several hours per day carrying water for their families. Without clean water and safe sanitation, real human and economic development is not possible.

This report is aimed at making a contribution towards assessing progress towards meeting water and sanitation related targets in South Africa using the GHS datasets for 2002–2010.

2. Overview of the water resources sector

2.1 Legislative framework

The Bill of Rights of the Constitution of the Republic of South Africa, Chapter 2, states that everyone has the right to have access to sufficient food and water, and the State must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of these rights (Section 27: 1(b) and 2). Everyone also has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure sustainable development and use of natural resources while promoting justifiable economic and social development. (Section 24).

According to the Department of Water Affairs' annual report for the financial year 2009/2010, the work of the Department is informed by various key legislative, policy and regulatory frameworks. This includes amongst others:

- Water Services Act [No. 108 of 1997] the objective of which is to provide for the rights of access to basic water supply and basic sanitation by setting national standards and norms.
- National Water Act [No. 36 of 1998]. The objective of this Act is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons.
- Water Research Act [No. 34 of 1971], the objective of which is to provide for the promotion of research in connection with water related issues.

The National Water Resources Strategy (2004) identified three fundamental objectives for managing South Africa's water resources, namely:

- To achieve equitable access to water;
- To achieve sustainable use of water; and
- To achieve efficient and effective water use.

2.2 Medium Term Strategic Framework and the national water and sanitation profile

The Medium Term Strategic Framework (MTSF) for the period 2009 to 2014 was approved by Cabinet on 1 July 2009. As part of the MTSF the government defined twelve outcomes. Outcome 8 relates to human settlements and by implication water and sanitation amongst other things, whilst Outcome 9 defines the role of local government. The document also noted that due to problems related to universal access to basic services, local government has lost the confidence of citizens (Delivery Agreement for Outcome 9: September 2010).

The delivery agreements for Outcomes 8 and 9 provide details about the outputs, targets, indicators and key activities to achieve, identify required inputs and clarify the roles and responsibilities of the various delivery partners. Seven critical issues to be addressed in order to achieve the goal of a responsive, accountable, effective and efficient local government system have been identified. One of these is to ensure improved access to essential services (Output 2). In this regard the following sub-outputs were identified in terms of improving universal access to basic services by 2014:

- Water from 92% to 100%
- Sanitation from 69% to 100%
- Refuse removal from 64% to 75%
- Electricity from 81% to 92%

The national departments of Human Settlements and Water Affairs are responsible for developing and monitoring compliance with regard to provision of sanitation services. There is an institutional requirement for support for planning and implementation of the services to be delivered through the IDP and the SDBIP by sector departments. For example, the national departments of Water Affairs and Human Settlements should assist municipalities to plan for the delivery of infrastructure and reduce rehabilitation backlogs in national water infrastructure; provinces (Human Settlements and local government departments) should develop and implement plans to support municipalities to increase household access to water.

Key partners that have been identified to share the implementation responsibility for Outcome 9 are the national departments and municipalities. The roles and responsibilities of national departments, which include the Department of Water Affairs, are to:

- Coordinate infrastructure funding to unlock delivery of services;
- Coordinate human settlement planning and service delivery planning;
- Evaluate and coordinate capacity building initiatives to ensure greater impact;
- Rationalise municipal reporting requirements;

- Liaise within their sector and better organise intergovernmental support to municipalities, e.g. Department of Water Affairs working with their regional offices, provinces, municipalities and water service authorities regarding water access and management; and
- Work with their provincial sector departments to support and monitor the interventions agreed upon.

The Department of Water Affairs (DWA) is directly responsible for policy and support to municipalities with respect to water supply and sanitation (this is a national function; the department has regional offices with substantial capacity). In reality, DWA plays a significant support role in respect of water services although it has recently moved towards emphasising its regulatory function. DWA controls the Regional Bulk Infrastructure Grant (RBIG) and is also responsible for landfill site registration and has regulatory responsibility over water boards.

The municipalities on the other hand are *the* key delivery partners in the field of implementation. As with organisational performance management systems, the performance management system of government will cascade from the Presidency to the smallest municipality.

Local government consists of (i) district municipalities and (ii) local municipalities.

District municipalities are established over the whole country (excluding the metros and with very little role in B1 municipalities) and are responsible for development facilitation and service provision, primarily water services, electricity and roads. The application of these responsibilities varies: C2 districts have considerable service provision responsibility while C1 districts are primarily development facilitators. The relationship and functionality between district and local municipalities is an important issue given the need to cooperate over infrastructure provision.

Local municipalities are responsible in terms of the constitution for specified services referred to as municipal services. These include: water supply and sanitation, electricity, municipal roads, solid waste and refuse removal and their associated infrastructure.

2.3 Millennium development goals and international context

The WHO/UNICEF Joint Monitoring Programme (JMP) Report: 2010 update contends that close to a billion people globally did not have access to water from an improved water source, and a third of that population is in Sub-Saharan Africa. Generally sub-Saharan Africa was lagging behind in progress towards the MDG target.

The report estimates that seven out of ten people are without improved sanitation and the largest number of people who still practise open defecation live in rural areas. However, there is also a growing number of people living in urban areas who defecate in the open. The UN Water World Development Report (2009) observed that about 340 million Africans lack access to safe drinking water, and almost 500 million lack access to improved sanitation facilities. Nearly 1,4 million children die each year from preventable diarrhoeal diseases and sub-Saharan Africa is one of the most affected regions.

The United Nations' Millennium Development Goals (MDGs) set targets that have to be met by the year 2015, with 1990 as the baseline year, and which requires that the world halve the proportion of people without sustainable access to safe drinking water and basic sanitation.

The MDG indicators used to measure this goal are:

- The proportion of population using an improved drinking-water source;
- The proportion of population using an improved sanitation facility.

The Water for Growth and Development Framework (2009) stated that the Department of Water Affairs (DWA) had reached the Millennium Development Goals (MDGs) targets with respect to halving water and sanitation backlogs in 2005 and 2008 respectively. In spite of the progress made, many South Africans still did not have access to basic water and sanitation services and the government had set a target to achieve universal access to basic water and sanitation services for all by 2014.

3. Objectives of this volume

The General Household Survey (GHS) is one of the sources of official statistics and contributes, amongst other things, towards the monitoring of selected indicators in relation to the performance of various government departments. It has been conducted since 2002 by Statistics South Africa (Stats SA). The survey mainly focuses on collecting data related to access to basic services and service delivery, and it is used by a number of government departments for planning, monitoring and evaluation. This volume focuses on information related to water and sanitation that was collected between 2002 and 2010 as part of the GHS series.

This report covers three broad areas:

1. Water supply: focusing on whether or not people have access to safe water, perceptions on quality of water services and frequency and duration of water supply interruptions.
2. Water quality: determining perceptions about the quality of the water South Africans use and whether it is safe.
3. Sanitation: types of toilet facilities used and changes over time.

4. Methodology and data

This study used the GHS 2002–2010 data series as indicated in the objectives. This is a multi-stage design which is based on a stratified design with probability proportional to size selection of primary sampling units (PSUs) at the first stage and sampling of dwelling units (DUs) with systematic sampling at the second stage. After allocating the sample to the provinces, the sample was further stratified by geography (primary stratification), and by population attributes using the Census 2001 data (secondary stratification). Survey officers employed and trained by Stats SA visited all the sampled dwelling units in each of the nine provinces. During the first phase of the survey, sampled dwelling units were visited and informed about the coming survey as part of the publicity campaign. The actual interviews took place four weeks later. A total of 30 000 households were interviewed during consecutive years using face-to-face interviews. Between 2002 and 2008, data collection took place over a period of two weeks in July of each year. Since GHS 2009, data collection is spread over three months during the period July to August of each year. As a result of the sample size and stratification design, data can only be aggregated down to provincial level. Data for the whole series as presented in this release were therefore comparable and the comparative analysis was made based on the premise that all samples were representative of the population of South Africa at the time when the survey was conducted.

More details related to the sampling and fieldwork methodology can be found in the GHS reports and metadata (2002-2010).

Stats SA revised the population model to produce mid-year population estimates during 2008 in the light of the findings of the Community Survey 2007 and new HIV/AIDS and mortality data. The new data have been used to adjust the benchmarking for all previous datasets. Weighting and benchmarking were also adjusted for the provincial boundaries that came into effect in December 2006. The data for the GHS 2002 to GHS 2010 as presented in this release are therefore comparable.

As a result of new statistical programs used for weighting, which discards records with unspecified values for the benchmarking variables, namely age, sex and population group, it became necessary to impute missing values for these variables. A combination of logical and hot-deck imputation methods was used to impute the demographic variables of the whole series from 2002–2010.

As with the 2009 report, household estimates that were developed using the UN headship ratio methodology were used to weight household files. The databases of Census 1996, Census 2001, Community Survey 2007 and the Labour Force Survey 2003, Labour Force Survey 2005, and Quarterly Labour Force Survey (quarter 3) of 2009 were used to analyse trends and develop models to predict the number of households for each year. The weighting system was based on tables for the expected distribution of household heads for specific age categories, per population group and province. Missing values and unknown values were excluded from totals used as denominators for the calculation of percentages, unless otherwise specified. Frequency values have been rounded off to the nearest thousand. Population totals in all tables reflect the population and sub-populations as calculated with SAS and rounded off. This will not always correspond exactly with the sum of the preceding rows because all numbers are rounded off to the nearest thousand.

SAS 9.0 and SAS Enterprise Guide were used for the data analysis. In addition to the use of descriptive statistics, modelling using logistic regression analysis and chi square tests were also used for selected indicators. Unspecified values (item non-response) were excluded from total that were used to calculate percentages.

5. Findings

5.1 Water

5.1.1 Introduction

The Department of Water Affairs defines a basic water supply facility as the infrastructure necessary to supply 25 litres of potable water per person per day within 200 metres of a household and with a minimum flow of 10 litres per minute (in case of communal water points) or 6 000 litres of potable water supplied per formal connection per month (in case of yard or house connections). Furthermore, their standards for basic water supply services include the sustainable operation of the facility in such a way that it is available for at least 350 days per year and not interrupted for more than 48 consecutive hours per incident. It also includes the communication of good water-use, hygiene and related practices.

The GHS measures certain aspects of water supply, more particularly the nature of sources used for drinking water, distance to source and a whole range of questions dealing with the quality of water and municipal water supply services. Not all the questions that currently appear in the GHS questionnaire have been asked since 2002. During the 2005 and 2009 revisions of the questionnaire, some questions were modified in collaboration with the Department of Water Affairs, making comparisons over time difficult.

This section provides a summary of the findings and more in-depth analysis of the trends over time as well as the present situation in relation to water supply and the quality of water provision. The discussion is subdivided into three sections. Firstly, water supply and water quality will be discussed for households in general. Then the situation of households living in informal dwellings (not in a backyard) will be explored. Finally, attention is paid to households classified as indigent.

5.1.2 General water supply and water quality

Table 1: Comparison of the main water source for drinking[1] used by households (numbers in thousands), 2002–2010)

Water source	Statistics	Year								
		2002	2003	2004	2005	2006	2007	2008	2009	2010
Piped water in dwelling	Number	4 484	4 648	4 711	4 871	5 122	5 323	5 776	5 808	5 943
	%	40,7	40,9	40,3	40,4	41,1	41,5	43,4	42,1	41,5
Piped water on site	Number	3 031	3 217	3 420	3 554	3 749	3 918	2 601	3 852	4 161
	%	27,5	28,3	29,2	29,5	30,1	30,6	27,1	27,9	29,1
Borehole on site	Number	146	93	195	163	146	158	162	200	180
	%	1,3	0,8	1,7	1,4	1,2	1,2	1,2	1,5	1,3
Rainwater tank on site	Number	63	51	42	35	54	66	73	49	55
	%	0,6	0,4	0,4	0,3	0,4	0,5	0,6	0,4	0,4
Neighbour's tap	Number	296	291	264	263	256	272	349	374	367
	%	2,7	2,6	2,3	2,2	2,1	2,1	2,6	2,7	2,6
Public/communal tap	Number	1 492	1 684	1 723	1 913	1 927	2 003	2 088	2 301	2 303
	%	13,6	14,8	14,7	15,9	15,5	15,6	15,7	16,7	16,1
Water-carrier-/tanker	Number	69	67	72	118	137	127	149	177	209
	%	0,6	0,6	0,6	1,0	1,1	1,0	1,1	1,3	1,5
Borehole off-site/ communal	Number	309	265	312	287	287	208	262	219	201
	%	2,8	2,3	2,7	2,4	2,3	1,6	2,0	1,6	1,4
Flowing water/stream/ river	Number	637	542	552	451	423	443	481	551	487
	%	5,8	4,8	4,7	3,7	3,4	3,5	3,6	4,0	3,4
Stagnant water/dam/ pool	Number	81	79	65	38	32	56	41	33	46
	%	0,7	0,7	0,6	0,3	0,3	0,4	0,3	0,2	0,3

* Numbers below 10 000 are too small to provide reliable estimates

[1] The 2005–2010 questionnaires specifically asked for drinking water sources, whilst the 2002–2004 questionnaires just measured the main source of water

Table 1: Comparison of the main water source for drinking[2] used by households (numbers in thousands), 2002–2010 (concluded)

Water source	Statistics	Year								
		2002	2003	2004	2005	2006	2007	2008	2009	2010
Well	Number	152	121	118	78	129	67	75	52	40
	%	1,4	1,1	1,0	0,7	1,0	0,5	0,6	0,4	0,3
Spring	Number	217	268	208	241	168	157	206	132	235
	%	2,0	2,4	1,8	2,0	1,3	1,2	1,5	1,0	1,6
Other	Number	28	29	18	46	26	26	34	63	78
	%	0,3	0,3	0,2	0,4	0,2	0,2	0,3	0,5	1,0
Subtotal	Number	11 005	11 355	11 700	12 058	12 430	12 824	13 262	13 812	14 304
	%	100	100	100	100	100	100	100	100	100
Unspecified	Number	7	6	12	17	26	76	34	0	0
Total		**11 013**	**11 362**	**11 712**	**12 075**	**12 456**	**12 901**	**13 296**	**13 812**	**14 304**

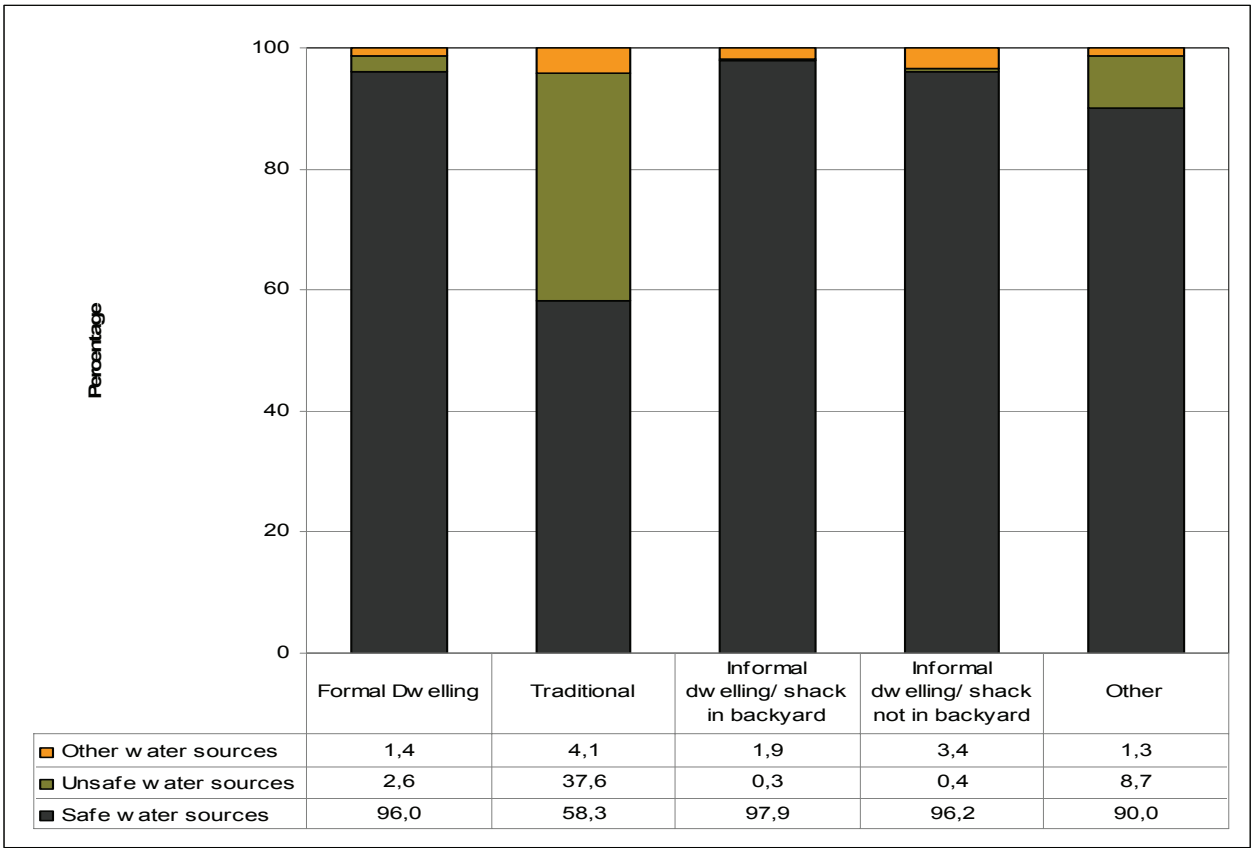
* Numbers below 10 000 are too small to provide reliable estimates

Table 1 indicates that approximately four in ten South African households have access to piped water inside their dwelling units. The percentage of households who reported to have such access ranged from 40,3% in 2004 to 41,5% in 2010, with a peak at 43,4% in 2008. General access to piped water on site rose steadily, from 27,5% in 2002 to 29,1% in 2010 with some fluctuation in the intervening years. Negligible proportions of households access borehole water for drinking within the perimeter of their yard

The provision of public/ communal taps to households without piped water on site, has increased over the years, as reflected by the increase in the percentage of households with access to public tap water, from 13,6% in 2002 to approximately 16% in 2010. In the intervening years there was a plateau (2005–2008) with no significant change. Concomitant with this there has been a general decrease in the percentage of households who draw water from natural water sources, such as streams, rivers, dams, wells, and springs. The largest decrease was reported in the percentage of households who had access to flowing water, streams, and rivers as a main source of drinking water. It decreased from roughly 6% in 2002 to 3,4% in 2006 where it remained until 2010 albeit with a slight increase in 2009 to 4%. The proportion of households that accessed wells and springs as main sources of water decreased steadily, from 1,4% in 2002 to 0,3% in 2010 with respect to wells, and for springs from 2% in 2002 to 1,6% in 2010.

[2] The 2005-2010 questionnaires specifically asked for drinking water sources, whilst the 2002-2004 questionnaires just measured the main source of water

Figure 1: Percentage of households accessing drinking water from safe, unsafe and other sources [3] in the dwelling/on-site/off-site, by types of dwelling[4], 2010



	Formal Dwelling	Traditional	Informal dwelling/ shack in backyard	Informal dwelling/ shack not in backyard	Other
Other water sources	1,4	4,1	1,9	3,4	1,3
Unsafe water sources	2,6	37,6	0,3	0,4	8,7
Safe water sources	96,0	58,3	97,9	96,2	90,0

Figure 1 shows that 96,0% of formal dwelling units reported to have access to safe water, whether inside the dwelling unit, in the yard, from a neighbour's tap or from a communal tap. Only 2,6% use water from unsafe sources. The highest percentage, however, was recorded for informal dwellings/shacks in backyards, with 97,9% of such households reporting to have access to safe water and 0,3% using unsafe water sources as a main source of water. More than 96,0% of households living in informal dwellings, not in backyards, reported to have access to safe water.

Traditional dwelling types (58,3%) were the least likely to have access to safe water relative to other types of dwellings. Households living in traditional dwelling units were the most likely of all dwellings types to use unsafe water sources/natural water sources as a main source of water (37,6%). Households in other types of dwellings, that is, caravans and tents, were the second most likely to use unsafe water sources as their main source of water, with almost 9% reporting access to that type of water. A higher percentage of households living in formal dwelling units (2,6%) use unsafe sources than both types of informal dwellings. Other housing types also have a significant percentage of unsafe water sources.

[3] Safe water sources: boreholes, piped or tap water in the dwelling, on-site or off-site

Unsafe water sources: dams, wells, springs, rivers and streams

Other water sources: rain-water tank, water-carrier/tanker

[4] 'Other' dwelling includes the options 'Other', 'Tent' and 'Caravan' from the questionnaire

Table 2: Water supply from a safe source (numbers in thousands)[5] in the dwelling, on or off-site, by province, 2002–2010[6]

Year	Statistics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2002	Number	1 155	872	244	700	1 714	766	2 666	728	913	**9 758**
	%	99,1	58,7	95,3	98,2	82,8	97,0	99,5	94,8	84,5	**88,7**
2003	Number	1 192	931	255	723	1 801	785	2 763	750	996	**10 198**
	%	99,1	61,4	97,2	99,0	84,2	96,9	99,3	94,4	89,4	**89,8**
2004	Number	1 236	1 014	259	738	1 908	808	2 878	759	1 026	**10 625**
	%	99,4	65,5	95,9	98,6	86,5	97,2	99,7	92,4	89,4	**90,8**
2005	Number	1 274	1 113	270	762	1 989	827	2 965	788	1 063	**11 050**
	%	99,5	70,5	97,7	99,4	87,4	97,1	98,8	93,0	90,0	**91,7**
2006	Number	1 329	1 154	278	781	2 062	841	3 099	801	1 143	**11 487**
	%	99,8	71,6	97,7	99,4	87,7	96,0	99,2	91,4	94,1	**92,2**
2007	Number	1 354	1 248	285	799	2 137	869	3 206	836	1 149	**11 883**
	%	99,6	75,7	97,9	98,6	88,1	96,6	99,2	92,4	91,6	**92,7**
2008	Number	1 415	1 227	289	822	2 197	893	3 330	878	1 186	**12 237**
	%	99,6	72,5	96,1	98,5	87,2	96,6	98,9	93,7	91,4	**92,0**
2009	Number	1 473	1 321	306	845	2 284	918	3 503	904	1 201	**12 755**
	%	99,7	76,0	98,4	98,2	87,3	96,2	99,2	92,4	89,2	**92,4**
2010	Number	1 517	1 324	312	875	2 362	939	3 618	923	1 286	**13 155**
	%	99,0	74,4	97,5	98,8	87,1	95,6	98,2	90,9	92,3	**92,9**

* Numbers below 10 000 are too small to provide reliable estimates

If the distance travelled to water is not taken into consideration, and safe sources are regarded as piped and/or tap or borehole water, the vast majority of South Africans have access to safe water (see Table 2). The provinces with the lowest coverage in terms of access to safe water in 2010 were Eastern Cape (74,4%) and KwaZulu-Natal (87,1%). However, these provinces – especially the Eastern Cape – showed remarkable progress since 2002 when only 58,7% had access to safe water (Eastern Cape) and 82,8% (KwaZulu-Natal) used safe water sources for drinking.

Having access to safe water does not mean that safe water access is easy access. As shown in Table 3, only 45% of those with access to safe water had access in their dwellings. The situation is worst in Limpopo (13,6%), North West (25,1%) and Mpumalanga (28,7%). However, in all these three provinces a significant proportion of households have access to piped/tap water in their yards. Western Cape once again had a water provision profile that is completely different from that of the other provinces with 79% accessing safe water in their dwellings and 13% in their yards.

[5] Safe water source refers to tap, piped or borehole water. It can also include water from boreholes. Distance is not taken into consideration

[6] Unspecified excluded from denominator used to calculate percentages

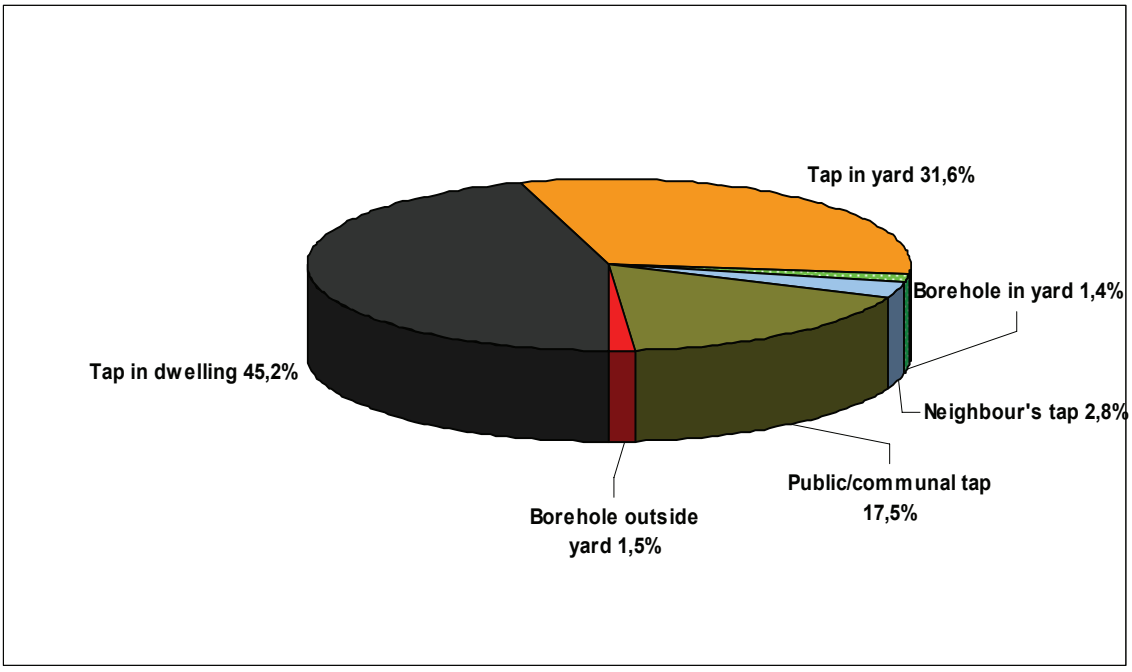
Table 3: Kinds of safe water sources used by households who have access to safe water, by province (numbers in thousands), 2010

Water source	Statis-tics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Piped/tap water in dwelling	Number	1 198	511	137	357	963	235	2 109	265	167	**5 943**
	%	79,0	38,6	44,1	40,8	40,8	25,1	58,3	28,7	13,0	**45,2**
Piped/tap water in yard	Number	199	288	93	445	719	400	1 131	440	448	**4 161**
	%	13,1	21,8	29,9	50,8	30,4	42,6	31,3	47,7	34,8	**31,6**
Borehole in yard	Number	0	2	12	5	4	36	32	9	79	**180**
	%	0,0	0,2	4,0	0,6	0,2	3,8	0,9	1,0	6,2	**1,4**
Neighbours' tap	Number	3	30	3	16	82	38	33	57	105	**367**
	%	0,2	2,3	0,9	1,8	3,5	4,0	0,9	6,2	8,2	**2,8**
Public/communal tap	Number	114	486	63	34	526	211	298	126	446	**2 303**
	%	7,5	36,7	20,1	3,9	22,3	22,5	8,2	13,6	34,7	**17,5**
Borehole outside yard	Number	3	6	4	18	68	20	15	26	41	**201**
	%	0,2	0,4	1,1	2,1	2,9	2,1	0,4	2,9	3,2	**1,5**
Total	Number	1 517	1 324	312	875	2 362	939	3 618	923	1 286	**13 155**
	%	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	**100,0**

* Numbers below 10 000 are too small to provide reliable estimates

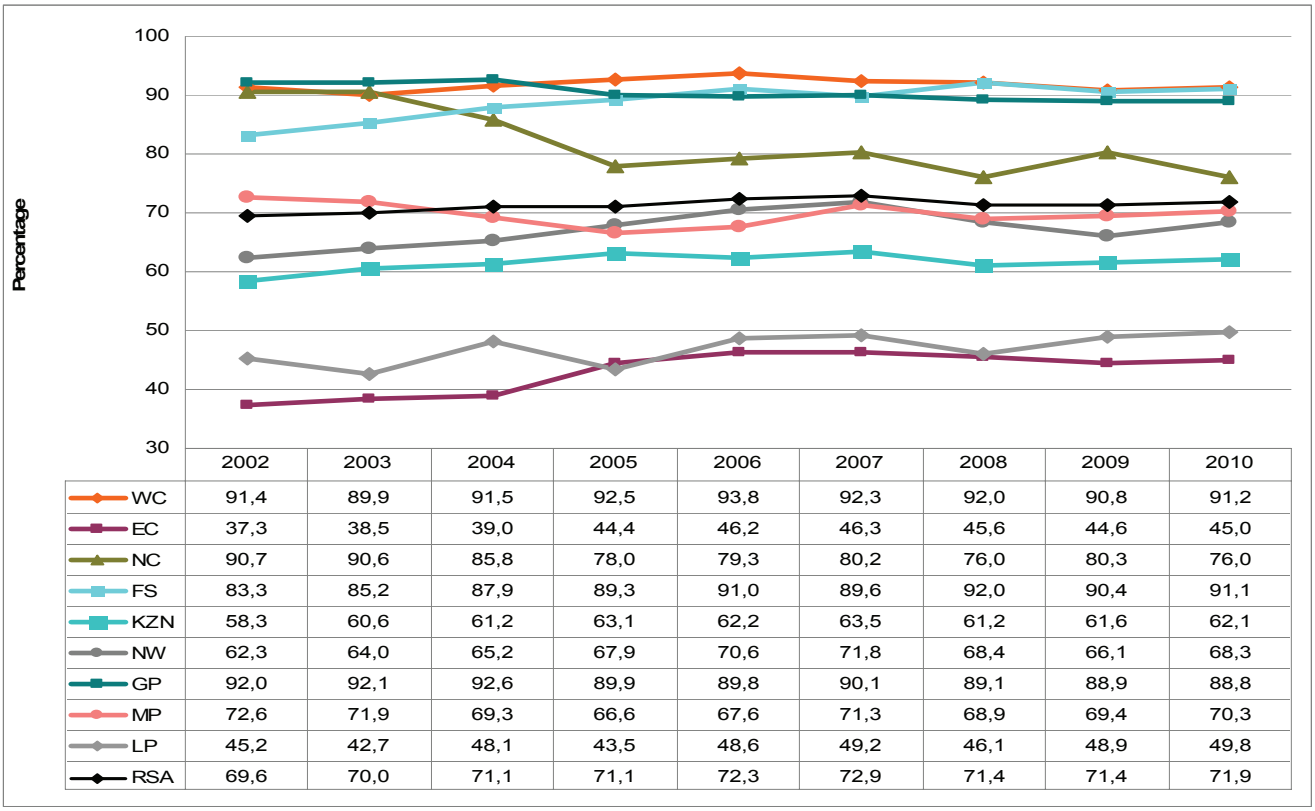
As mentioned previously and depicted in Figure 2, most of the households (45,2%) that reported that they have access to safe water in 2010, accessed their water from taps within their dwelling units, with close to 32,0% of households using safe water in their yards. Almost 18,0% of households mentioned that they only had access to water from public or communal taps.

Figure 2: Percentage of households using specific types of safe water sources as a percentage of those who accessed safe water, 2010



Nearly 3,0% of households in the country accessed safe water from their neighbours' taps, whereas the percentage of households who accessed safe water from boreholes, either within their yards (1,4%), or outside (1,5%) comprised the lowest percentage of households with access to that particular type of safe water.

Figure 3: Percentage of households with access to safe water in the dwelling/on-site, by province, 2002–2010



	2002	2003	2004	2005	2006	2007	2008	2009	2010
WC	91,4	89,9	91,5	92,5	93,8	92,3	92,0	90,8	91,2
EC	37,3	38,5	39,0	44,4	46,2	46,3	45,6	44,6	45,0
NC	90,7	90,6	85,8	78,0	79,3	80,2	76,0	80,3	76,0
FS	83,3	85,2	87,9	89,3	91,0	89,6	92,0	90,4	91,1
KZN	58,3	60,6	61,2	63,1	62,2	63,5	61,2	61,6	62,1
NW	62,3	64,0	65,2	67,9	70,6	71,8	68,4	66,1	68,3
GP	92,0	92,1	92,6	89,9	89,8	90,1	89,1	88,9	88,8
MP	72,6	71,9	69,3	66,6	67,6	71,3	68,9	69,4	70,3
LP	45,2	42,7	48,1	43,5	48,6	49,2	46,1	48,9	49,8
RSA	69,6	70,0	71,1	71,1	72,3	72,9	71,4	71,4	71,9

Nationally, the percentage of households who had access to safe water in their dwellings, or on-site increased from 69,6% in 2002 to 72,9% in 2007 (Figure 3). Thereafter, the figure shows a noticeable decrease, as reflected by the 71,4% for both 2008 and 2009. There was a slight increase again in 2010 to 71,9%. Gauteng and Western Cape showed the highest percentages of households with access to safe water in their dwellings/on-site, with 92,0% and 91,4% in 2002, respectively. From 2005 until 2010, Western Cape had the highest percentage of households with access to safe water in their dwellings, with levels of around 92% over that period. Gauteng showed a steady decline in households reporting access since 2004, with the lowest percentage recorded in 2010 (88,8%). This could possibly be attributed to an increase in informal dwellings in the large metropolitan areas of Gauteng making it difficult for the metropolitan councils to keep up with the need for safe water supply services. There has been an overall upward trend of households in Free State that reportedly had access to piped/tap/borehole water in their dwellings/on-site, from a low of 83,3% in 2002, peaking at 92,0% in 2008, with roughly 91% indicating access in 2010. Overall, Eastern Cape had the lowest percentage of households who indicated having access to safe water in their dwellings/on-site in 2002 (37,3%). They were closely followed by Limpopo with 45,2%. Both provinces however, reflected upward trends in the percentage of households who reported having access to safe water. In 2010, Eastern Cape and Limpopo province recorded 45,0% and 49,8%, respectively. Once again Eastern Cape is the province with the lowest percentage of households with access to tap/piped/borehole water in the dwelling/on-site.

Table 4: Predictors of access to safe water in dwelling or yard, by province using logistic regression[7], 2010[8]

Description of variable	Province									
	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Model indicators:										
Likelihood ratio chi square	671,4	1 979,0	737,15	274,3	2 005,2	673,0	1 204,0	685,7	577,6	1 440,1
N	2 818	2 939	1 459	2 181	3 935	2 160	3 595	2 445	2 700	2 4232
Intercept	8,0387	5,352	4,1544	5,9166	3,25	4,1779	3,8954	3,7589	6,8159	1,8969
Maximum Likelihood estimates										
Dwelling has four or less rooms	-2,153	-0,833	-0,918	-0,607	-0,695	n/a	**-0,729**	n/a	-0,294	-0,457
Dwelling fully or partially owned	1,2692	0,9157	0,9664	-0,74	0,5982	0,7205	**0,3841**	n/a	n/a	0,5893
Municipal water services rating: poor	-1,579	n/a	-0,815	-0,777	0,8216	0,3806	**-0,64**	-0,562	-0,51	-0,303
RDP or higher toilet standard	3,3746	1,7454	1,4997	1,1831	1,4062	2,0216	**1,0996**	1,3089	0,9713	1,3505
Connection to the mains electricity supply	1,7657	2,1477	0,8662	1,5322	2,209	1,872	**2,8168**	1,3992	0,8156	1,7089
Rubbish removed at least once a week	1,7066	3,2254	3,7417	2,0074	-0,82	1,8216	**2,8894**	2,8183	2,7791	2,7332
Monthly expenditure R1800 or less	-0,529	-1,063	-0,892	n/a	-0,555	-0,727	n/a	n/a	-0,689	-0,689
Household receives at least one social grant	n/a	-0,774	n/a	n/a	n/a	-0,592	n/a	n/a	-0,288	-0,377
Household head aged 35 years or younger	-0,404	n/a	-0,91	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Household size greater than 3,5 persons	n/a	0,2815	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

n/a = values that are not significant at the 95% of 99% levels of significance are not reflected here.

[7] Dependent variable: Use unsafe water, value of 0 if safe or other and value of 1 if unsafe

All provided estimates significant at 1% level except bolded estimates that are significant at 5% level

Also tested but not found significant: Female headed household, household head younger than 35 years, formal dwelling, monthly expenditure less than R1 800 per month

[8] The table provides the coefficients (m) for each factor that contributes towards the regression model (y=mx+c). The intercept (c) shows how steep the line is, where it will cross the y axis and whether the regression line leans forward or backward. The larger the coefficient the bigger is the relative contribution of that factor to the overall regression model. A negative coefficient means that the opposite of that factor has a relationship with the dependent variable (y). More details about the composition of variables can be found in Section 8

Logistic regression is commonly used with discrete data to explore relationships between variables as part of multivariate analysis. A number of indicators, especially socio-economic indicators were explored in terms of their ability to predict access to safe water. Table 4 summarises the models that were developed for access to safe water using stepwise logistic regression. These are summarised nationally and per province. The table shows that in South Africa, access to safe water is strongly associated with home ownership and good access to services (sanitation, refuse removal, formal dwelling). Access to safe water is negatively associated with having four or less rooms, monthly expenditure of R1800 or less and household head aged 35 years or younger.

In Eastern Cape where access to safe water is the lowest, predictors of access include: full or partial ownership of a dwelling, sanitation of RDP standard or higher, connection to the mains, removal of rubbish at least once a week and household size greater than 3,5 persons. It is negatively associated with having four or less rooms in the dwelling, monthly expenditure of R1 800 or less and the receipt of social grants. For Limpopo, the negative predictors were dwellings having four or less rooms, poor municipal services ratings, monthly expenditure of R1800 or less and receipt of social grants. Positive relationships exist between access to safe water and having sanitation facilities of RDP standard or higher, connection to the mains electricity supply and removal of rubbish at least once a week.

Free State, Gauteng and Mpumalanga had the lowest variety of predictors of safe water access. On the positive side these provinces included RDP or higher toilet standard, removal of rubbish at least once a week and connection to the mains electricity supply. An additional positive predictor for Gauteng is dwelling fully or partially owned. Negative predictors for Gauteng and Free State were having four or less rooms in the dwelling, for Free State dwelling fully or partially owned, and for all three poor municipal services ratings. In KwaZulu-Natal the main predictors of access to safe water were: dwelling fully or partially owned, municipal services ratings poor, RDP or higher sanitation facility, and connection to mains electricity supply. Negative predictors included: a dwelling with four or less rooms, rubbish removed at least once a week and monthly expenditure of R1800 or less.

Table 5: Access to piped or tap water in the dwelling/on site or off-site, by province (numbers in thousands), 2002 to 2010

Year	Statis-tics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2002	Number	1 151	843	236	680	1 577	677	2 643	696	800	**9 303**
	%	98,8	56,8	92,2	95,5	76,2	85,6	98,7	90,6	74,1	**84,5**
2003	Number	1 190	910	252	709	1 683	733	2 754	727	882	**9 840**
	%	98,8	60,0	96,1	97,1	78,7	90,3	99,0	91,4	79,2	**86,7**
2004	Number	1 233	988	251	710	1 762	734	2 851	723	865	**10 118**
	%	99,2	63,9	93,1	94,8	79,9	88,3	98,8	88,1	75,4	**86,5**
2005	Number	1 266	1 092	263	744	1 870	743	2 943	762	918	**10 601**
	%	99,0	69,2	95,4	97,0	82,2	87,2	98,1	89,9	77,7	**87,9**
2006	Number	1 324	1 141	271	768	1 923	796	3 067	779	984	**11 055**
	%	99,4	70,8	95,5	97,7	81,8	90,9	98,2	88,9	81,1	**88,7**
2007	Number	1 351	1 238	277	782	2 037	810	3 168	804	1 049	**11 517**
	%	99,5	75,1	95,2	96,5	84,0	90,0	98,0	88,9	83,7	**89,8**
2008	Number	1 409	1 204	273	816	2 078	836	3 293	833	1 071	**11 814**
	%	99,1	71,1	90,7	97,9	82,5	90,4	97,8	88,8	82,6	**88,8**
2009	Number	1 471	1 305	298	818	2 204	839	3 459	854	1 088	**12 335**
	%	99,6	75,1	95,9	95,0	84,3	87,9	98,0	87,3	80,8	**89,3**
2010	Number	1 514	1 316	296	852	2 290	883	3 571	887	1 165	**12 774**
	%	98,8	73,9	92,5	96,2	84,4	90,0	96,9	87,4	83,6	**89,3**

Safe water as summarised in Table 3 reflects tap/piped/borehole sourced water supply regardless of whether it is in the dwelling, in the yard or off-site. Table 5 narrows this down to water supply that is exclusively from piped/tap sources without considering boreholes or distance. There has been a steady increase in this kind of access between 2002 and 2007 from 84,5% to 89,3%. Post 2007 the national percentage stabilised around 89%, indicating that this kind of water supply kept track with growth in the number of households, but was unable to go beyond that towards closing the service delivery gap in the water sector.

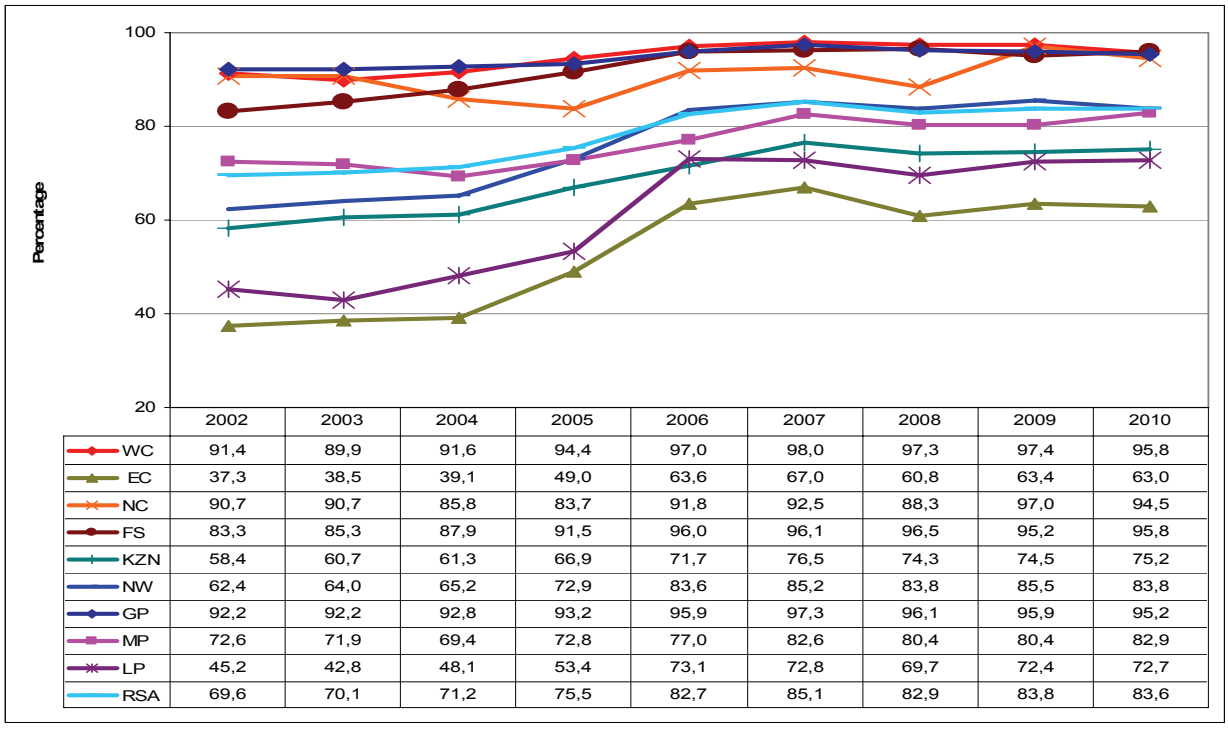
Table 6: Access to water at RDP standard[9], by province (numbers in thousands), 2002–2010

Year	Statistics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2002	Number	1 065	554	232	594	1 209	493	2 469	558	488	**7 661**
	%	91,4	37,3	90,7	83,3	58,4	62,4	92,2	72,6	45,2	**69,6**
2003	Number	1 082	585	238	623	1 297	519	2 566	572	476	**7 958**
	%	89,9	38,5	90,7	85,3	60,7	64,0	92,2	71,9	42,8	**70,1**
2004	Number	1 138	605	231	659	1 352	542	2 677	569	552	**8 325**
	%	91,6	39,1	85,8	87,9	61,3	65,2	92,8	69,4	48,1	**71,2**
2005	Number	1 208	773	231	702	1 522	621	2 797	617	631	**9 102**
	%	94,4	49,0	83,7	91,5	66,9	72,9	93,2	72,8	53,4	**75,5**
2006	Number	1 293	1 024	261	755	1 685	732	2 994	675	887	**10 306**
	%	97,0	63,6	91,8	96	71,7	83,6	95,9	77,0	73,1	**82,7**
2007	Number	1 331	1 105	270	779	1 855	767	3 146	747	913	**10 912**
	%	98,0	67,0	92,5	96,1	76,5	85,2	97,3	82,6	72,8	**85,1**
2008	Number	1 383	1 030	266	805	1 872	775	3 237	754	904	**11 026**
	%	97,3	60,8	88,3	96,5	74,3	83,8	96,1	80,4	69,7	**82,9**
2009	Number	1 439	1 102	301	819	1 948	816	3 386	786	975	**11 571**
	%	97,4	63,4	97,0	95,2	74,5	85,5	95,9	80,4	72,4	**83,8**
2010	Number	1 468	1 121	302	848	2 038	823	3 508	841	1013	**11 963**
	%	95,8	63,0	94,5	95,8	75,2	83,8	95,2	82,9	72,7	**83,6**

The concept of access to water at RDP standard is similar to access to safe water in that it refers to piped/tap/borehole water in the dwelling on and off-site (Table 6 and Figure 4). However, the primary difference between these two concepts is that water at RDP standard has to be at a distance of 200 metres or less from the dwelling. Table 6 summarises the provincial profiles for water at RDP standard from 2002 to 2010. In 2002 Eastern Cape (37,3%), Limpopo (45,2%) and KwaZulu-Natal (58,4%) had the lowest proportions of households with access to water at RDP standard. Even though all three these provinces were still behind the other provinces in 2010, they have made substantial progress. In 2010, 25,7% more households in Eastern Cape, 16,8% in KwaZulu- Natal and 27,5% in Limpopo had access to piped and or tap water than in 2002. Even though North West did not start at such a low note their access increased with 21,4 percentage points from 62,4% in 2002 to 83,8% in 2010. Residents of Western Cape (95,8%), Northern Cape (94,5%) and Gauteng (95,2%) were the most likely to have access to piped/tap water in 2010.

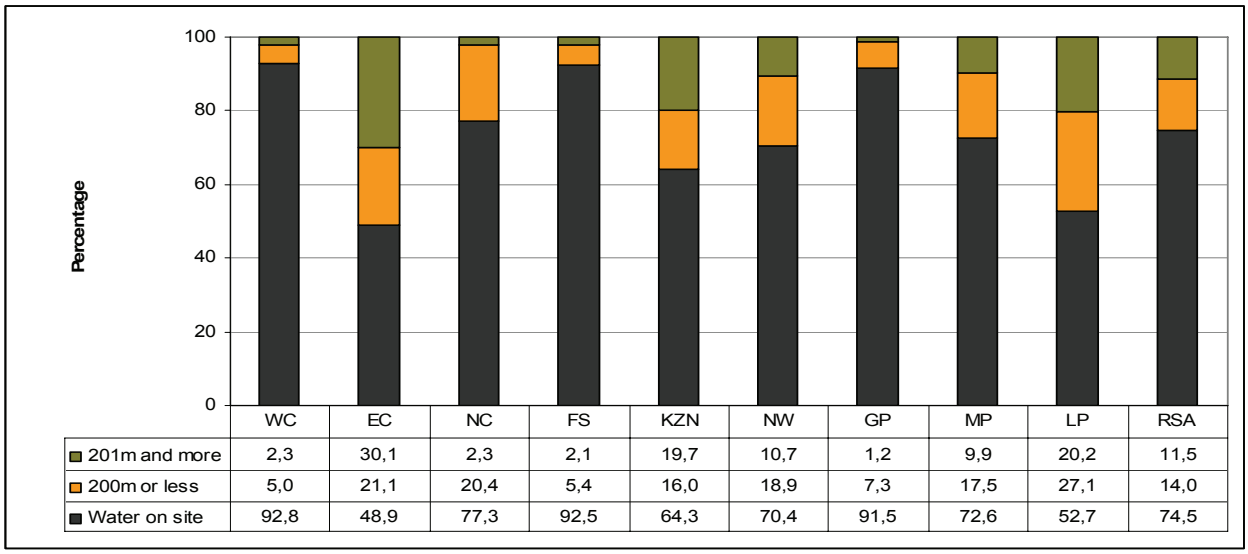
[9] Water at RDP standard refers to piped/tap water in the dwelling or yard and if not in the dwelling or yard within 200 meters from the dwelling.

Figure 4: Percentage of households with access to water at RDP standard, by province, 2002–2010



	2002	2003	2004	2005	2006	2007	2008	2009	2010
WC	91,4	89,9	91,6	94,4	97,0	98,0	97,3	97,4	95,8
EC	37,3	38,5	39,1	49,0	63,6	67,0	60,8	63,4	63,0
NC	90,7	90,7	85,8	83,7	91,8	92,5	88,3	97,0	94,5
FS	83,3	85,3	87,9	91,5	96,0	96,1	96,5	95,2	95,8
KZN	58,4	60,7	61,3	66,9	71,7	76,5	74,3	74,5	75,2
NW	62,4	64,0	65,2	72,9	83,6	85,2	83,8	85,5	83,8
GP	92,2	92,2	92,8	93,2	95,9	97,3	96,1	95,9	95,2
MP	72,6	71,9	69,4	72,8	77,0	82,6	80,4	80,4	82,9
LP	45,2	42,8	48,1	53,4	73,1	72,8	69,7	72,4	72,7
RSA	69,6	70,1	71,2	75,5	82,7	85,1	82,9	83,8	83,6

Figure 5: Percentage of households who have to walk to reach the nearest water source and the distance walked, by province, 2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
201m and more	2,3	30,1	2,3	2,1	19,7	10,7	1,2	9,9	20,2	11,5
200m or less	5,0	21,1	20,4	5,4	16,0	18,9	7,3	17,5	27,1	14,0
Water on site	92,8	48,9	77,3	92,5	64,3	70,4	91,5	72,6	52,7	74,5

Approximately 12% of households in the country walked 201 metres (m) or more, whilst a further 14% of households walked 200m or less, to access a water source (see Figure 5). Nearly 75% of South African households in 2010 had access to water inside their dwelling units or on-site. Eastern Cape (30,1%), Limpopo (20,2%), and KwaZulu-Natal (19,7%) had the highest percentage of households who had to walk 201m or more to reach the nearest source of water, while households in Gauteng were the least likely to walk more than 201m (1,2%), followed by Free State (2,1%) and Western Cape (2,3%).The highest percentage of households who reported that they had to walk up to 200m to reach a water source countrywide, was recorded in Limpopo, with 27,1% of households, and with 21,1% of households, Eastern Cape reported the second highest prevalence, while

Northern Cape (20,4%) reported the third highest percentage. Western Cape (5%) and Free State (5,4%) showed the lowest percentages of households who walked less than 200m to reach their nearest source of water.

According to Figure 5, Western Cape (92,8%) had the highest percentage of households who had water on-site, households in Free State (92,5%) were the second most likely to access water on-site, compared to 91,5% of households in Gauteng. The provinces with the lowest percentage of households with water on site were: Eastern Cape (48,9%), Limpopo (52,7%) and KwaZulu-Natal (64,3%).

Table 7: Households who have to walk a distance of more than 200m to reach a water source, by province (numbers in thousands)[10] [11], 2006–2010

Year	Statistics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2006	Number	32	383	15	23	416	105	75	132	229	**1409**
	%	2,4	25,1	5,4	2,9	19,2	12,4	2,4	15,8	20,1	**11,8**
2007	Number	18	316	15	19	381	93	61	114	254	**1271**
	%	1,3	20,2	5,3	2,4	16,5	10,6	1,9	13,0	21,2	**10,2**
2008	Number	27	378	23	11	420	100	69	126	275	**1429**
	%	1,9	24,5	7,7	1,4	17,6	11,2	2,1	14,0	22,5	**11,2**
2009	Number	17	406	3	12	474	57	46	129	231	**1376**
	%	1,1	24,6	0,9	1,5	18,9	6,4	1,3	13,7	18,3	**10,3**
2010	Number	34	516	7	18	517	102	41	97	265	**1599**
	%	2,3	30,1	2,3	2,1	19,7	10,7	1,2	9,9	20,2	**11,5**

* Numbers below 10 000 are too small to provide reliable estimates

Between 2006 and 2010 the percentage of households who walk/travel more than 200km for their water fluctuated over time (Table 7). However, there was a generally declining trend from 11,8% in 2006 to 11,5% in 2010. Even though water infrastructure is fixed, distances travelled to reach water depend to a large extent on maintenance of particularly communal water infrastructure. Thus households may have had a borehole with hand-pump installed less than 200 metres from their dwelling, but if the hand-pump breaks down and is not repaired, the household may have to access a hand-pump further away. Hence some variation is observed in distance travelled, whilst access to safe water had shown a steady upward trend line over time.

Provinces where the proportion of households who have to travel distances of 201m or more has declined steadily over time were:

- North West (from 12,4% to 10,7%)
- Mpumalanga (from 15,8% to 9,9%)
- Free State (from 2,9% to 2,1%)
- Gauteng (from 2,4% to 1,2%)

[10] Unspecified excluded from denominator used to calculate percentages, but includes households who get their water onsite or in the dwelling

[11] Prior to 2006 distance was measured in minutes and especially the categories for distances more than 200 metres are not comparable to the post 2005 datasets

Provinces with more inconsistent and variable profiles for distance include: Eastern Cape, Limpopo, and KwaZulu-Natal. In the case of Eastern Cape in addition to the variation across time, more households had to travel 201 metres or more in 2010 (30,1%) than in 2002 (25,1%).

Table 8: Households who receive municipal water and that pay for it, by province (numbers in thousands), 2005–2010[12] [13] [14]

Year	Statistics	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2005	Number	957	542	160	417	919	408	1 988	283	257	**5 931**
	%	79,6	53,9	70,8	61,7	61,0	66,0	70,4	41,7	30,9	**62,0**
2006	Number	1 008	589	145	465	1 017	377	1 951	320	282	**6 154**
	%	83,0	59,1	77,2	65,7	64,7	74,1	68,0	52,6	35,9	**65,1**
2007	Number	1 071	583	151	450	1 036	466	2 170	344	274	**6 544**
	%	83,7	50,4	72,5	62,2	63,5	69,8	72,4	54,6	29,7	**64,1**
2008	Number	1 080	561	169	451	1 035	387	2 355	341	216	**6 597**
	%	84,0	54,9	72,8	63,6	65,5	65,8	77,3	56,9	29,0	**67,2**
2009	Number	956	536	167	381	928	344	1 812	322	236	**5 683**
	%	68,9	43,5	63,1	48,8	45,7	49,0	53,4	39,2	28,0	**49,6**
2010	Number	913	486	160	350	1 016	329	1 914	270	211	**5 649**
	%	64,2	38,7	61,4	44,2	46,1	48,2	54,2	31,9	20,8	**47,1**

* Numbers below 10 000 are too small to provide reliable estimates

Table 8 shows that 62,0% of households in South Africa paid for access to municipal water in 2005. This figure increased to 65,1% the following year, but declined to 64,1% in 2007. The highest level was reached in 2008 when slightly over two-thirds of South African households paid for municipal water services. A sharp decline in payment was witnessed since then to 47,1% in 2010. This may be associated with a general decline in economic conditions following the 2008 economic slump as well as an increase in support to indigent households as evidenced from the reasons given for non-payment (Figure 7). The most significant decreases between 2005 and 2010 were reported in the following provinces:

- Free State and North West (18% points decrease)
- Gauteng (16% points decrease)
- Western Cape, Eastern Cape, KwaZulu-Natal and Limpopo (15% points decrease)

Of most concern is the decline for Limpopo, where payment rates were the lowest to start off with and where significant decreases also occurred over time. Figure 6 illustrates the findings summarised in Table 8. Western Cape province was consistently higher in percentage terms compared to other provinces in terms of payment for water services, but it is also clear that there was a generally decreasing trend in the percentage of households who pay for municipal water, except for particular years across the country. Northern Cape, Gauteng, and North West were interchangeably second, third and fourth in the period under review.

[12] Unspecified excluded from denominator used to calculate percentages

[13] The question on payment was introduced for the first time in the GHS 2005 questionnaire

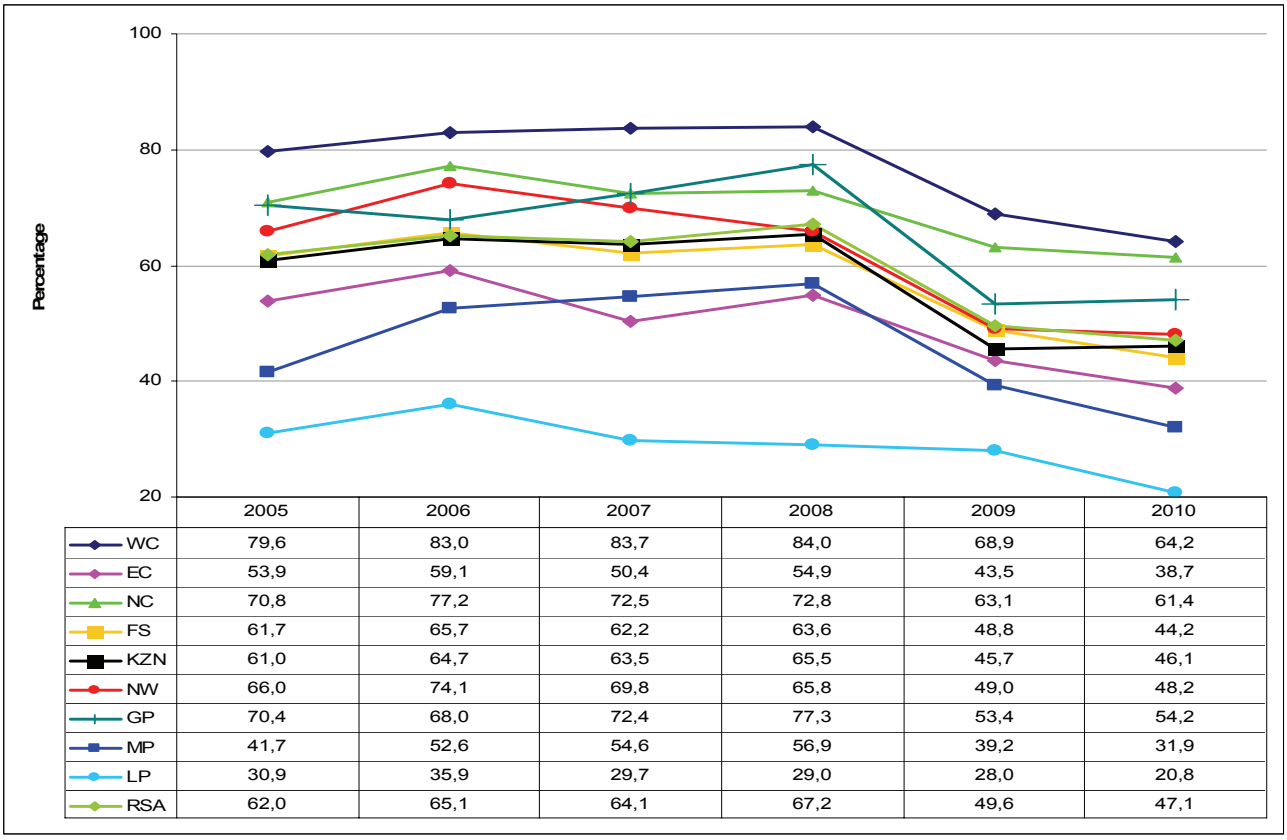
[14] This question was measured for the first time in 2005

The percentage of households who paid for municipal water services was at its highest in 2008, with Western Cape (84%), Gauteng (77,3%), and Northern Cape (72,8%) recording high percentages. Currently the provinces with the highest payment rates are: Western Cape (64,2%), Northern Cape (61,4%) and Gauteng (54,2%). The provinces with the lowest payment rates for municipal water in 2010 were:

- Limpopo (20,8%)
- Mpumalanga (31,9%)
- Eastern Cape (38,7%)
- Free State (44,2%)

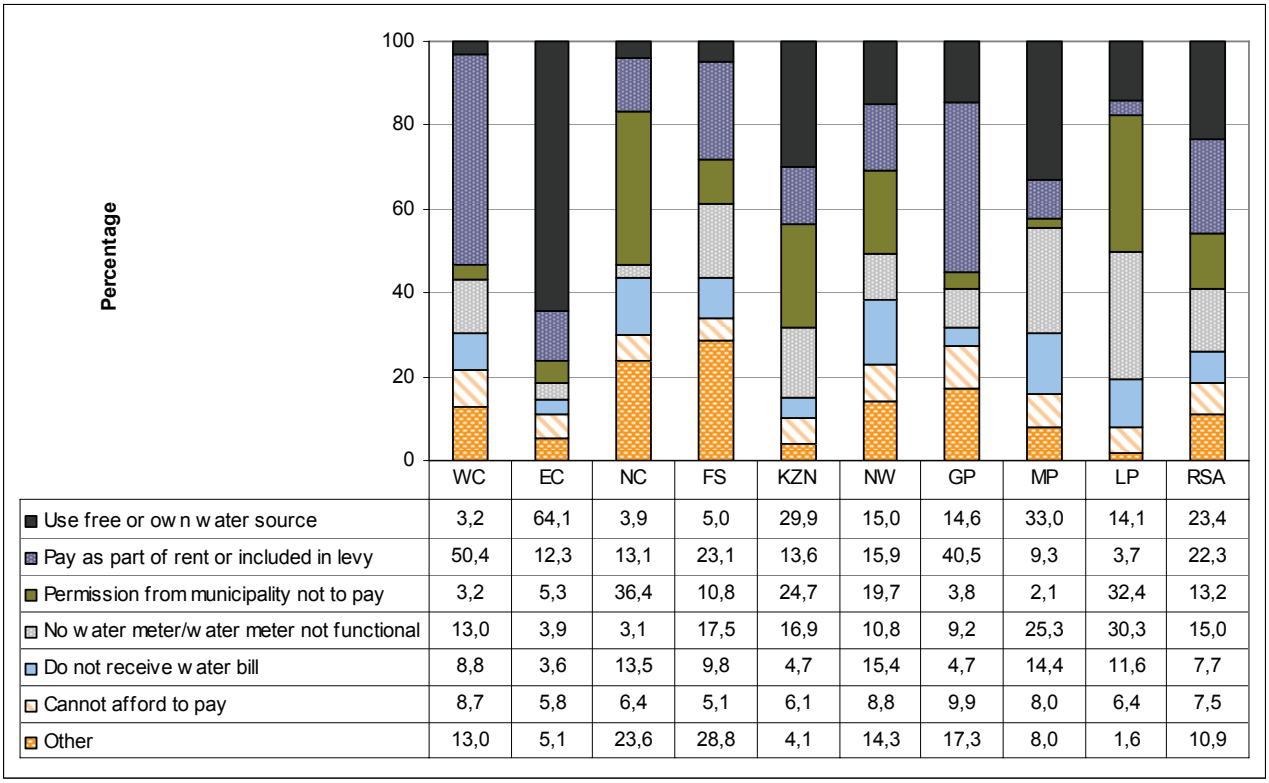
These four provinces had the lowest payment rates in 2005 and, as in the other provinces there has also been a decline in payment over time.

Figure 6: Percentage of households who are paying for the municipal water that they use, by province, 2005–2010



	2005	2006	2007	2008	2009	2010
WC	79,6	83,0	83,7	84,0	68,9	64,2
EC	53,9	59,1	50,4	54,9	43,5	38,7
NC	70,8	77,2	72,5	72,8	63,1	61,4
FS	61,7	65,7	62,2	63,6	48,8	44,2
KZN	61,0	64,7	63,5	65,5	45,7	46,1
NW	66,0	74,1	69,8	65,8	49,0	48,2
GP	70,4	68,0	72,4	77,3	53,4	54,2
MP	41,7	52,6	54,6	56,9	39,2	31,9
LP	30,9	35,9	29,7	29,0	28,0	20,8
RSA	62,0	65,1	64,1	67,2	49,6	47,1

Figure 7: Percentage distribution of the reasons for not paying for municipal water services, by province, 2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Use free or own water source	3,2	64,1	3,9	5,0	29,9	15,0	14,6	33,0	14,1	23,4
Pay as part of rent or included in levy	50,4	12,3	13,1	23,1	13,6	15,9	40,5	9,3	3,7	22,3
Permission from municipality not to pay	3,2	5,3	36,4	10,8	24,7	19,7	3,8	2,1	32,4	13,2
No water meter/water meter not functional	13,0	3,9	3,1	17,5	16,9	10,8	9,2	25,3	30,3	15,0
Do not receive water bill	8,8	3,6	13,5	9,8	4,7	15,4	4,7	14,4	11,6	7,7
Cannot afford to pay	8,7	5,8	6,4	5,1	6,1	8,8	9,9	8,0	6,4	7,5
Other	13,0	5,1	23,6	28,8	4,1	14,3	17,3	8,0	1,6	10,9

Almost two–thirds (64,0%) of households who did not pay for access to water in Eastern Cape said that they did not pay because they accessed water from a free water source. Eastern Cape is significantly different from the rest of the provinces and this may relate to the fact that a high proportion of residents live on tribal land and water is accessed from communal water sources. The second highest proportions of non-paying households for the same reason were found in Mpumalanga (33,0%) and KwaZulu-Natal (29,9%) both of which also have sizable tribal land and a communal water use system.

Approximately 50,0% of households in Western Cape that did not get billed separately for water services mentioned that it was because they paid for the services as part of rent, or it was included in levies, and about 40,5% of households in Gauteng gave that same reason for not paying separately for water services. These cases cannot strictly be regarded as cases where no payment took place.

Northern Cape (36,4%) had the highest percentage of households who had been granted permission by municipalities not to pay to access water services, with households in Limpopo (32,4%) the second most likely not to pay because they received permission from their municipalities.

A lack of water meters or faulty water meters was given as a reason for not paying by roughly 30,3% of households in Limpopo, 25,3% of households in Mpumalanga, and 17,5% in Free State. The non-receipt of water bills is a problem in a few provinces as well. More than 15,4% of households in North West mentioned that they did not receive their water bill as a reason for not paying for water services, followed by Mpumalanga (14,4%) and Northern Cape (13,5%). Affordability was most likely to be cited as a reason in Gauteng (9,9%), North West (8,8%), and Western Cape (8,7%).

Table 9: Payment for municipal services and ratings of municipal services, by province (numbers in thousands), 2010[15]

Payment for municipal water	Statistics	Rating of municipal services			Total
		Good	Average	Poor	
No	Number	3 530	1 981	801	**6 312**
	Row percentage	55,9	31,4	12,7	**100,0**
	Column percentage	46,6	61,5	71,3	**-**
Yes	Number	4 050	1 241	322	**5 613**
	Row percentage	72,2	22,1	5,7	**100,0**
	Column percentage	53,4	38,5	28,7	**-**
Total		**7 580**	**3 222**	**1 124**	**11 925**

Tables 9 and 10 look at the association between payment for water services compared to rating of services and quality of water against payment. Households who paid for water were statistically significantly more likely to rate their municipal water services as good or average, whilst those who did not pay were more likely to rate the water services as poor. The likelihood ratio chi-square test indicated at a 99% confidence level ($p<0.0001$) that there is a statistically significant relationship between the rating for services and payment.

Households who did not pay for their water were more likely to say that their water had a bad taste, was not safe and had bad smells compared to those who did pay. When comparing payment and negative ratings of quality the observed frequencies differed statistically significantly from the expected frequency at a 95% confidence level using the likelihood ratio chi-square measure ($p=0.0542$). There is therefore a relationship between water quality and probability to pay for water services.

Table 10: Payment for municipal services and ratings of water quality, by province (numbers in thousands), 2010[16]

Water quality	Statistics	Payment		Total
		No	Yes	
Bad in taste	Number	301	270	**570**
	%	52,7	47,3	**100,0**
Not clear	Number	29	30	**59**
	%	49,2	50,8	**100,0**
Not safe	Number	28	27	**55**
	%	50,3	49,7	**100,0**
Bad smells	Number	50	23	**73**
	%	68,6	31,5	**100,0**
Total		**408**	**350**	**758**

[15] Unspecified excluded from denominator used to calculate percentages

[16] Unspecified excluded from denominator used to calculate percentages

Table 11: Predictors of non-payment for municipal water, by province using logistic regression[17], 2010[18]

Description of variable	Province									
	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Model indicators: Likelihood ratio chi square	1381,7	1128,2	497,9	507,7	1650,6	562,3	1698,5	1314,2	808,5	10079,7
N	2677	2051	1328	2045	3167	1674	3492	2143	2049	20626
Intercept	4,0657	2,9088	0,4229	0,0848	0,528	1,1796	-0,3274	2,4244	4,1907	1,804
Maximum Likelihood estimates										
Household head 35 years or younger	0,7305	0,6567	n/a	n/a	n/a	n/a	0,4959	0,3831	n/a	0,4107
Dwelling has four or less rooms	1,4286	0,8331	1,0503	1,0127	1,454	0,5666	1,3789	0,8502	0,6899	0,9947
Dwelling fully or partially owned	1,7823	1,1125	0,9708	0,5465	0,5449	0,8261	1,3991	1,299	1,0714	1,0581
Municipal water services rating: poor	n/a	1,0168	0,8113	n/a	0,6975	n/a	n/a	n/a	0,7414	0,5011
RDP or higher toilet standard	-3,7806	-2,4961	n/a	n/a	n/a	n/a	n/a	-1,8147	-2,4265	-1,094
Connection to the mains electricity supply	-2,161	-2,4577	-1,6885	n/a	-1,0076	-1,8682	-1,6888	n/a	-1,8609	-1,4672
Rubbish removed at least once a week	-2,8043	-2,1167	-2,4045	-1,9709	-2,3424	-2,011	-1,7093	-4,1348	-3,5358	-2,5928
Monthly household expenditure R1800 or less	0,4768	1,1288	0,7852	1,025	1,1477	0,8241	0,6573	0,4881	0,8129	0,8433
Household receives at least one social grant	n/a	0,7031	n/a	0,3823	0,3678	0,456	0,3922	0,5547	0,6875	0,4236
Household size greater than 3.5	0,286	n/a	0,3256	**-0,2587**	-0,3067	n/a	n/a	n/a	n/a	n/a

n/a = values that are not significant at the 95% of 99% levels of significance are not reflected here.

[17] Dependent variable: Value of 0 if pay for water and value of 1 if do not pay

All provided estimates significant at 1% level except bolded estimates that are significant at 5% level

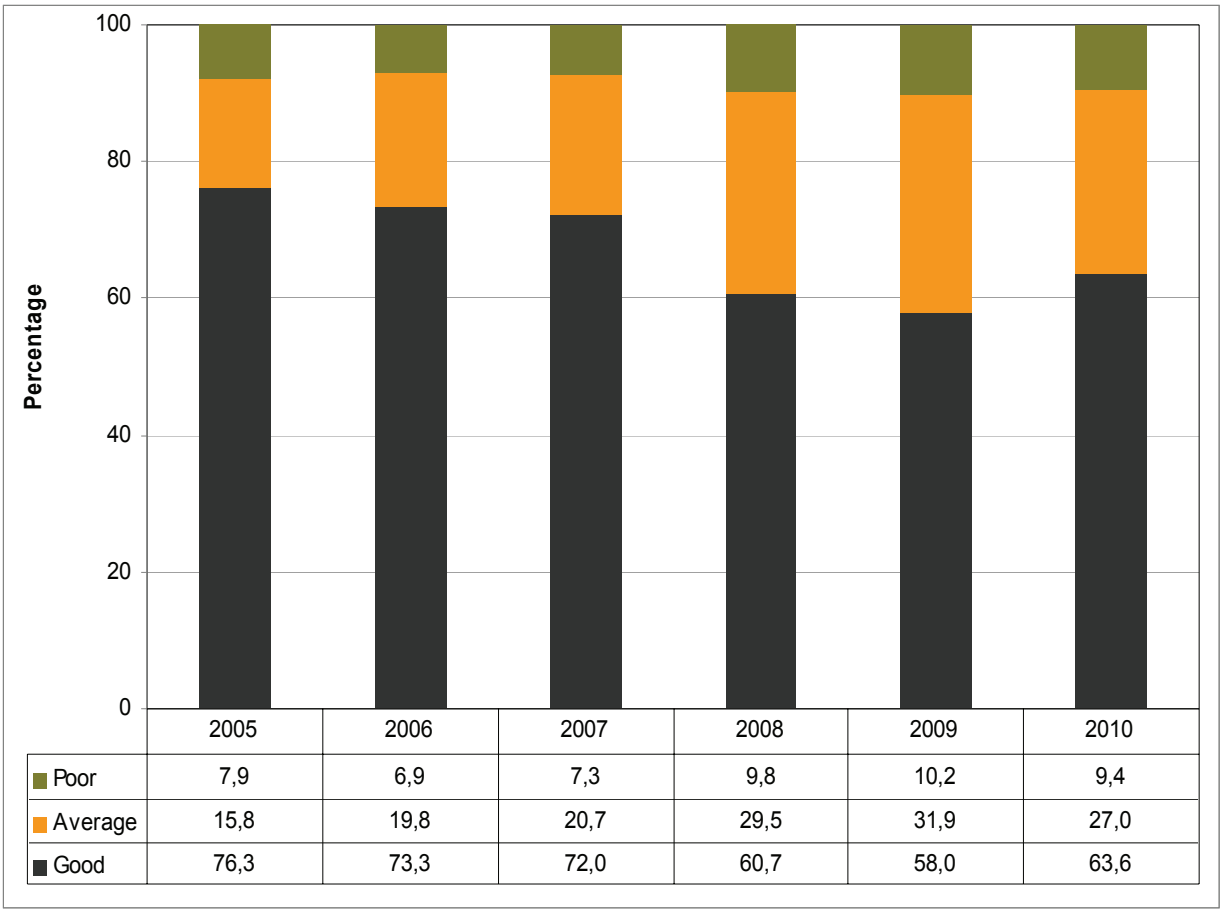
Also tested but not found significant: Female headed household, formal dwelling

[18] The table provides the coefficients (m) for each factor that contributes towards the regression model (y=mx+c). The intercept (c) shows how steep the line is, where it will cross the y axis and whether the regression line leans forward or backward. The larger the coefficient the bigger is the relative contribution of that factor to the overall regression model. A negative coefficient means that the opposite of that factor has a relationship with the dependent variable (y). More details about the composition of variables can be found in Section 8

Logistic regression models were developed for Table 11 to predict non-payment for municipal water. It shows that there is a negative relationship between non-payment and rubbish removed at least once a week, connection to the mains electricity supply and sanitation of RDP standard or higher. There is a positive relationship between non-payment and household head younger than 35 years, four or less rooms in the dwelling, home ownership, municipal services ratings poor, monthly expenditure of R1800 or less and the receipt of at least one social grant by the household. Of these factors, having four or less rooms in the dwelling, full or partial ownership of the dwelling, and monthly expenditure below R1800 were significant positive predictors across all provinces. The removal of refuse at least once a week and connection to the mains negatively associated with non-payment for water services across all provinces except for connection to the mains in the case of Free State and Mpumalanga.

In Limpopo and Mpumalanga where non-payment was most prevalent, positive predictors for non-payment included: dwelling with four or less rooms, dwelling fully or partially owned, monthly expenditure of R1800 or less and household received at least one social grant. In Limpopo poor municipal services ratings and in Mpumalanga having a household head of 35 years or younger also play a role. Negative predictors for both provinces include: having a sanitation facility of RDP standard or higher and having rubbish removed at least once a week or more often. Connections to the mains electricity supply was an additional negative predictor in Limpopo.

Figure 8: Percentage of households using municipal water that rated the quality of municipal water services as poor, average or good, 2005–2010



	2005	2006	2007	2008	2009	2010
Poor	7,9	6,9	7,3	9,8	10,2	9,4
Average	15,8	19,8	20,7	29,5	31,9	27,0
Good	76,3	73,3	72,0	60,7	58,0	63,6

According to the Figure 8, the percentage of households who perceived municipal water services as 'Good' has steadily declined from 76,3% in 2005 to 58,0% in 2009. The year 2010 saw an increase of approximately 5,0% to 63,6% in the percentage of households who rated municipal services as 'Good'. However, this is still well below the 2005 level of 76,3%. Over the same period, the percentage of households that thought the service is 'Average' rose from about 16,0% in 2005, peaked at about 32,0% in 2009 and thereafter decreased to 27,0% in 2010. The percentage of households who perceive municipal water services as 'Poor' saw a decrease in 2006 from roughly 8,0% in 2005 to 6,9% in 2006. However, the graph shows a general increase, which reached a peak at 10,2% in 2009, and thereafter decreasing to 9,4% in 2010.

Table 12: Households who receive municipal water and that have experienced water interruptions in the past twelve months, by province (numbers in thousands), 2009–2010[19] [20]

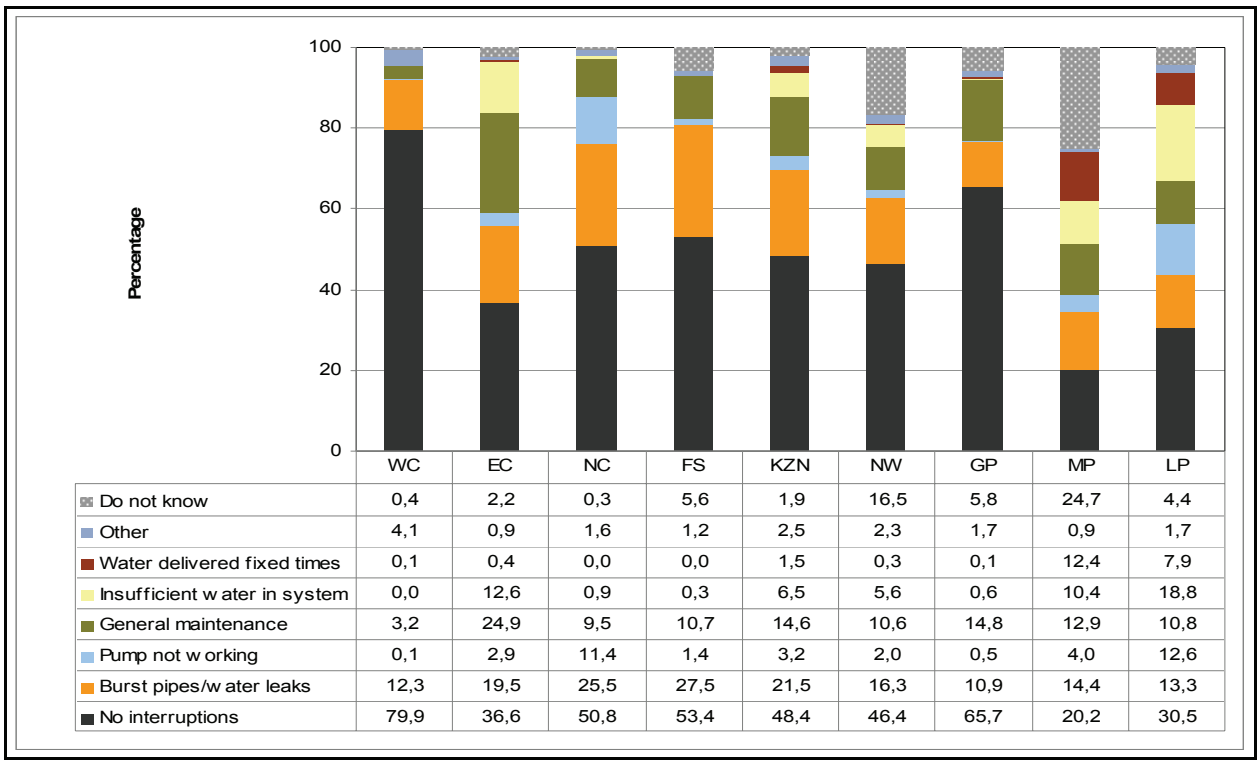
Year	Statistics	Provinces									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2009	Number	319	658	101	407	1 436	312	1 271	621	566	5 691
	National %	5,6	11,6	1,8	7,2	25,2	5,5	22,3	10,9	9,9	100,0
	Provincial %	22,9	53,4	37,9	52,1	70,6	44,4	37,5	75,6	67,0	49,6
2010	Number	289	797	129	373	1 149	369	1 227	679	710	5 721
	National %	5,1	13,9	2,3	6,5	20,1	6,4	21,4	11,9	12,4	100,0
	Provincial %	20,3	63,4	49,5	47,1	52,0	53,9	34,7	80,0	69,8	47,6

* Numbers below 10 000 are too small to provide reliable estimates

[19] Unspecified excluded from denominator used to calculate percentages

[20] The water interruption questions were revised for GHS 2009 and are not comparable to what was measured before

Figure 9: Percentage of households connected to the municipal water supply that did not have interruptions during the past twelve months and for those who had interruptions the causes, by province, 2010[21],[22]



	WC	EC	NC	FS	KZN	NW	GP	MP	LP
Do not know	0,4	2,2	0,3	5,6	1,9	16,5	5,8	24,7	4,4
Other	4,1	0,9	1,6	1,2	2,5	2,3	1,7	0,9	1,7
Water delivered fixed times	0,1	0,4	0,0	0,0	1,5	0,3	0,1	12,4	7,9
Insufficient w ater in system	0,0	12,6	0,9	0,3	6,5	5,6	0,6	10,4	18,8
General maintenance	3,2	24,9	9,5	10,7	14,6	10,6	14,8	12,9	10,8
Pump not w orking	0,1	2,9	11,4	1,4	3,2	2,0	0,5	4,0	12,6
Burst pipes/w ater leaks	12,3	19,5	25,5	27,5	21,5	16,3	10,9	14,4	13,3
No interruptions	79,9	36,6	50,8	53,4	48,4	46,4	65,7	20,2	30,5

Table 12 shows the percentage of households from each province that experienced water interruptions between 2009 and 2010. Nationally there was a decrease in water interruptions experienced during the year preceding the survey from 49,6% in 2009 to 47,6% in 2010. In 2010 Mpumalanga had the highest percentage (80,0%) of households who had at least one interruption during the 12 months preceding the survey. They were followed by Limpopo (69,8%) and Eastern Cape (63,4%). Interruptions were the least likely to occur in Western Cape (20%) and Gauteng (34,7%). Between 2009 and 2010, the proportion of households affected by interruptions increased in all provinces except in Western Cape and KwaZulu-Natal. In the Western Cape 22,9% in 2009 and 20,3% in 2010 experienced interuptions, whilst in KwaZulu-Natal the proportion of households who suffered interruptions decreased from 70,6% in 2009 to 52,0% in 2010. Water interruptions that are due to general maintenance are pre-planned and households are usually informed before the maintenance activities. However, as according to the responses summarised in Figure 9, there is a whole range of reasons why households experience interruptions. These include amongst other insufficient water in the system (18,8%), burst pipes/water leaks (13,3%) and general maintenance (10,8%).

[21] Unspecified excluded from denominator used to calculate percentages

[22] The percentages of households who did not have interruptions differed slightly from those reflected in Table 8. The reason for that is that households with problems who did not report causes were excluded from the denominator in Figure 8

Table 13: Length of interruptions for households who received water from municipal sources that have experienced water interruptions during the past twelve months, by province (numbers in thousands), 2009–2010[23] [24]

Year	Statistics	Provinces									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Interruptions that lasted for two consecutive days or longer during past 12 months											
2009	Number	29	424	23	143	603	179	251	430	485	2 566
	National %	1,1	16,5	0,9	5,6	23,5	7,0	9,8	16,8	18,9	100,0
	Provincial %	9,0	64,8	22,5	35,3	42,1	58,0	20,0	69,4	86,5	**45,4**
2010	Number	31	449	75	134	628	209	233	507	573	2 839
	National %	1,1	15,8	2,6	4,7	22,1	7,4	8,2	17,9	20,2	**100,0**
	Provincial %	10,8	56,3	57,8	36,1	54,8	56,9	19,1	74,8	81,2	**49,8**
Total number of days with interruptions over the period of one year is 15 days or longer											
2009	Number	9	284	10	95	378	138	116	285	419	1 733
	National %	0,5	16,4	0,6	5,5	21,8	7,9	6,7	16,5	24,2	100,0
	Provincial %	3,0	43,7	10,3	23,5	26,6	44,6	9,3	46,0	74,5	**30,9**
2010	Number	15	322	35	75	339	136	235	460	429	2 046
	National %	0,7	15,8	1,7	3,7	16,6	6,7	11,5	22,5	21,0	**100,0**
	Provincial %	5,3	40,5	27,4	20,7	29,7	37,4	19,6	68,0	60,7	**36,2**

* Numbers below 10 000 are too small to provide reliable estimates

The stated target for quality service delivery of the DWA is that water interruptions should be resolved within 48 hours or two consecutive days. Table 13 summarises the length of interruptions. Of the residents who had interruptions during the past year (July 2009 to August 2010), those living in Limpopo (20,2%), KwaZulu-Natal (22,1%) and Mpumalanga (17,9%) were most likely to have experienced interruptions that lasted two or more days. Interruptions were least likely to occur in Western Cape (1,1%) and Northern Cape (2,6%). Once the provincial population is taken into consideration, by calculating percentages relative to the households in the province, the pattern changes.

Limpopo, Mpumalanga and KwaZulu-Natal still had some of the highest levels of interruptions (81,2%, 74,8% and 54,8% respectively). However, this time Eastern Cape (56,3%) and North West (56,9%) also had high proportions of households affected by interruptions lasting 2 days or longer. Within provinces, reflecting the relative problems with interruptions lasting two days in succession or longer, the poorest performing provinces were:

- Mpumalanga (74,8%)
- Limpopo (81,2%)
- Northern Cape (57,8%)
- Eastern Cape (56,3%)
- North West (56,9%)

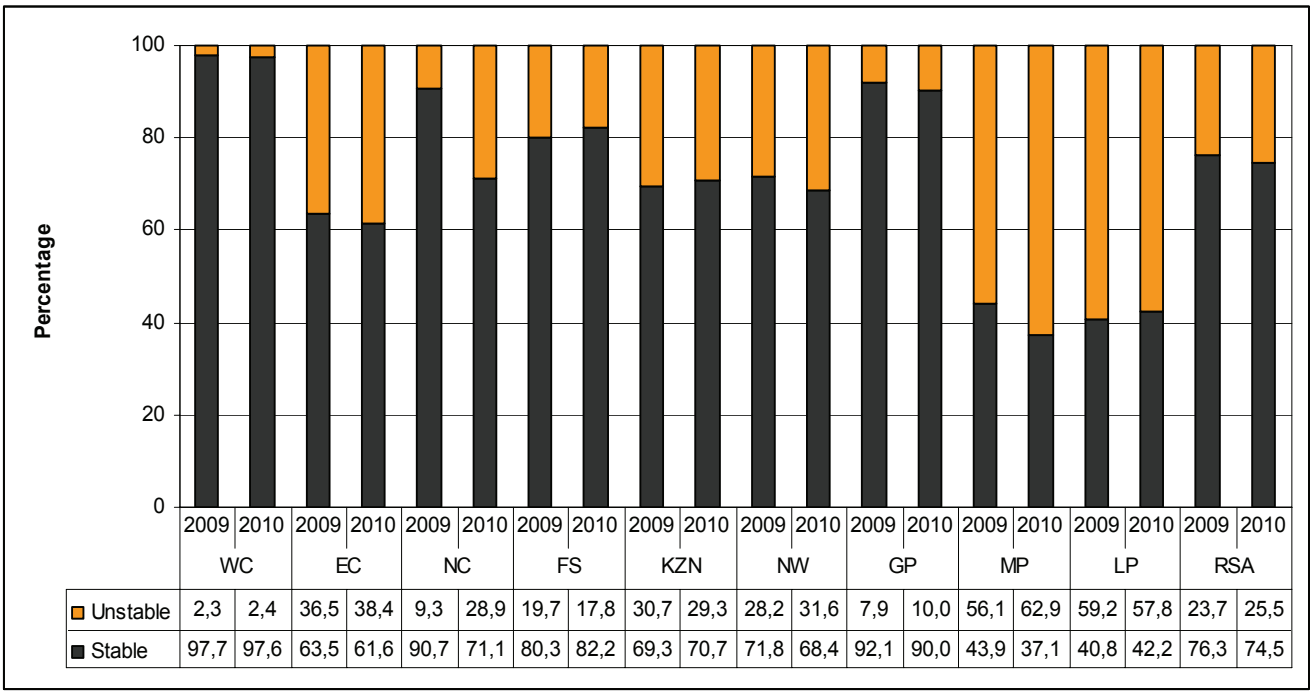
[23] Unspecified and do not know excluded from denominator used to calculate percentages

[24] The water interruption questions were revised for GHS 2009 and are not comparable to what was measured before

Table 13 also reflects the numbers of those who experienced interruptions who had problems that lasted for 15 days or more over a period of 12 months. Most of the households who had cases with a combined total of interruptions for 15 days or more in 2010 were from Mpumalanga (22,5%), Limpopo (21,0%) and KwaZulu-Natal (16,6%). Interruptions were least likely to last a total of 15 days or longer in Western Cape (0,7%), Free State (3,7%) and Northern Cape (1,7%). Once provincial populations are taken into consideration, provinces with the biggest problems related to interruptions that lasted 15 days or longer in total were: Mpumalanga (68,0%), Limpopo (60,7%) and Eastern Cape (40,5%).

Figure 10 summarises the extent to which households were affected during the one year reference period with interruptions that were longer than two consecutive days and or interruptions that totalled 15 days or more during the year preceding the survey. Such households are referred to in the graph as having an unstable water supply.

Figure 10: Percentage of households who had stable and unstable municipal water supplies, 2009–2010



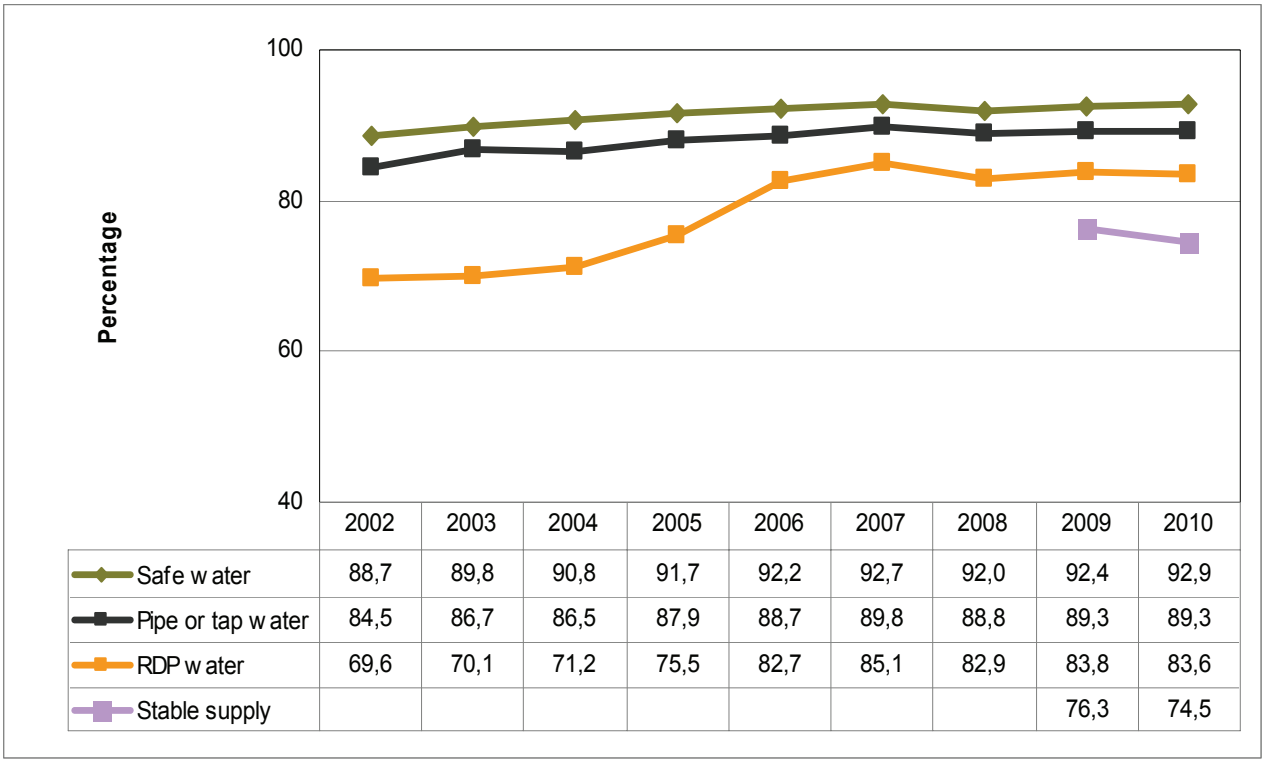
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
	WC		EC		NC		FS		KZN		NW		GP		MP		LP		RSA	
Unstable	2,3	2,4	36,5	38,4	9,3	28,9	19,7	17,8	30,7	29,3	28,2	31,6	7,9	10,0	56,1	62,9	59,2	57,8	23,7	25,5
Stable	97,7	97,6	63,5	61,6	90,7	71,1	80,3	82,2	69,3	70,7	71,8	68,4	92,1	90,0	43,9	37,1	40,8	42,2	76,3	74,5

Between 2009 and 2010, the percentage of households affected by an unstable water supply increased nationally (from 23,7% to 25,5%) and the highest proportions of interruptions in 2010 were found in Limpopo (57,8%) and Mpumalanga (62,9%). The rates of interruptions increased in all provinces except Free State (19,7% in 2009 compared with17,8% in 2010), KwaZulu-Natal (30,7% in 2009 compared with 29,3% in 2010) and Limpopo (59,2% in 2009 compared with 57,8% in 2010) where there were declines. The proportion of households who had unstable water supplies increased most significantly in the Northern Cape (from 9,3% to 28,9%), Mpumalanga (from 56,1% to 62,9%) and North West (from 28,2% to 31,6%).

Figure 11 combines the preceding graph related to stable municipal water supply with the various national indicators related to access to water. It shows that since 2002 access to RDP-standard water (piped, tap borehole within 200 metres of the dwelling) increased dramatically. However, since 2007 there has been a degree of stabilisation for all three water access modes illustrated. The percentage of households who have a stable municipal supply is well below all the other categories of water access and has declined between 2009 and 2010.

Even though significant amounts of money have been spent on water infrastructure improvements, the levelling off of the graph post 2007 may indicate that these funds could have been spent on improving access for households who were already receiving access within the 200 metres from their dwellings. It could also reflect poor maintenance and service delivery, especially in areas dependent on communal water facilities. If a hand-pump, which is within 200m of the homestead, breaks down and is not repaired the household will still have access to safe water from hand-pumps elsewhere in the village, beyond 200 metres from the dwelling.

Figure 11: Percentage of households who receive water from a safe source, piped or tap water on or off-site, RDP water and have a stable supply from a municipal source [25], 2002–2010



	2002	2003	2004	2005	2006	2007	2008	2009	2010
Safe water	88,7	89,8	90,8	91,7	92,2	92,7	92,0	92,4	92,9
Pipe or tap water	84,5	86,7	86,5	87,9	88,7	89,8	88,8	89,3	89,3
RDP water	69,6	70,1	71,2	75,5	82,7	85,1	82,9	83,8	83,6
Stable supply								76,3	74,5

[25] The questions related to water interruptions used to determine stable supply were only included from 2009 onwards

Table 14: Predictors of water supply interruptions, by province using logistic regression[26], 2010[27]

Description of variable	Province									
	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Model indicators: Likelihood ratio chi square	26,639	405,13	123,18	182,7	368,84	275,89	62,725	182,53	332,27	3136,7
N	2502	1967	1281	2000	2984	1613	3218	2092	1992	19649
Intercept	-2,463	-0,209	0,4925	-0,673	0,8708	0,6495	-0,668	2,7305	1,1795	0,5144
Maximum likelihood estimates										
Dwelling fully or partially owned	n/a	0,3393	**-0,288**	n/a	-0,31	-0,78	-0,27	-0,891	-0,667	-0,321
Household size greater than 3.5	n/a	0,4395	n/a	n/a	0,2186	n/a	n/a	n/a	n/a	0,0906
Water quality: number of problems	n/a	n/a	n/a	n/a	n/a	0,3157	n/a	n/a	n/a	0,1764
Municipal water services rating: poor	1,3876	1,9477	0,9891	0,529	1,5285	1,5939	0,9225	0,9863	3,3258	1,3927
RDP or higher toilet standard	n/a	n/a	1,0688	1,3155	n/a	0,9666	n/a	n/a	n/a	0,3418
Rubbish removed at least once a week	1,0217	-1,294	-1,323	-1,273	-0,974	-1,038	0,3075	-0,941	-0,606	-1,217
Monthly household expenditure R1800 or less	n/a	n/a	-0,438	0,7206	n/a	n/a	0,3628	**0,281**	n/a	0,2381
Monthly income R1800 or less	n/a	0,5257	n/a	-0,352	n/a	n/a	n/a	n/a	n/a	0,1009
Household receives at least one social grant	n/a	0,5022	n/a	**0,2047**	**0,1863**	n/a	n/a	n/a	**0,2874**	0,1798
Dwelling has four or less rooms	n/a	0,4637	0,4117	n/a	n/a	n/a	n/a	n/a	0,3357	n/a

n/a = values that are not significant at the 95% of 99% levels of significance are not reflected here.

The logistic regression models summarised in Table 14 indicate that nationally, good predictors of the likelihood that interruptions will take place are: household sizes greater than 3,5 members, number of water quality problems experienced, poor municipal services ratings, toilet facilities of RDP standard or higher, monthly household income and expenditure of R1 800 or lower, and receipt of at least one social grant. Interruptions are negatively related to the full or partial ownership of a dwelling and the removal of rubbish at least once a week. This model indicates for the country as a whole, and more specifically in the Eastern Cape, Limpopo and Free State, that a household's socio-economic standard contributes significantly to whether interruptions will be experienced with households with

[26] Dependent variable: Value of 0 if no interruption during past 12 months and value of 1 if at least one interruption

All provided estimates significant at 1% level except bolded estimates that are significant at 5% level

Also tested but not found significant: Female headed household, household head younger than 35 years, formal dwelling

[27] The table provides the coefficients (m) for each factor that contributes towards the regression model (y=mx+c). The intercept (c) shows how steep the line is, where it will cross the y axis and whether the regression line leans forward or backward. The larger the coefficient the bigger is the relative contribution of that factor to the overall regression model. A negative coefficient means that the opposite of that factor has a relationship with the dependent variable (y). More details about the composition of variables can be found in Section 8

poor access to services, low security of tenure, poorly functioning municipalities, low incomes and dependence on social grants.

Table 15 reflects water quality ratings across provinces between 2005 and 2010. It shows that in 2005, roughly 17% of households in Eastern Cape perceived the quality of water they drink as not safe to drink, and almost 19% of households in Mpumalanga reported that the water was not clear. Just over 22% of households in Limpopo thought that the water they drank did not taste good, whereas almost 17% of households in North West municipal water had a bad smell.

Table 15: Perceptions of households regarding the quality of municipal water, by province (numbers in thousands), 2005–2010 [28]

Year	Perceptions	Statis-tics	Province									
			WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2005	Not safe to drink	Number	21	41	8	34	23	17	22	39	32	**237**
		%	8,7	17,4	3,6	14,2	9,8	7,1	9,2	16,4	13,7	**100,0**
	Not clear	Number	28	48	11	41	30	32	34	59	36	**319**
		%	8,7	15,0	3,3	13,0	9,3	10,1	10,8	18,5	11,4	**100,0**
	Not good in taste	Number	33	77	17	53	30	29	31	48	91	**408**
		%	8,1	18,8	4,1	13,0	7,3	7,1	7,6	11,7	22,4	**100,0**
	Not free from bad smells	Number	33	43	11	42	44	59	34	46	43	**354**
		%	9,2	12,2	3,0	11,9	12,4	16,6	9,6	13,1	12,2	**100,0**
2006	Not safe to drink	Number	15	41	6	45	28	10	41	52	11	**248**
		%	6,1	16,4	2,4	18,1	11,4	4,1	16,4	20,8	4,3	**100,0**
	Not clear	Number	30	54	9	53	33	10	51	72	15	**326**
		%	9,1	16,5	2,8	16,3	10,2	3,0	15,5	22,0	4,7	**100,0**
	Not good in taste	Number	16	75	8	55	37	14	54	63	50	**371**
		%	4,2	20,1	2,1	14,9	10,0	3,8	14,6	16,9	13,5	**100,0**
	Not free from bad smells	Number	28	39	6	46	34	14	62	60	14	**304**
		%	9,3	12,9	2,0	15,1	11,2	4,6	20,5	19,8	4,6	**100,0**
2007	Not safe to drink	Number	16	40	4	32	15	17	17	52	22	**215**
		%	7,5	18,8	1,9	14,8	7,1	7,7	7,9	24,3	10,2	**100,0**
	Not clear	Number	25	45	4	39	20	38	17	59	28	**276**
		%	9,1	16,3	1,6	14,3	7,1	13,8	6,2	21,4	10,3	**100,0**
	Not good in taste	Number	20	72	7	42	21	40	28	59	77	**367**
		%	5,5	19,7	1,9	11,5	5,7	11,0	7,7	16,0	21,0	**100,0**
	Not free from bad smells	Number	26	38	3	40	26	38	19	61	32	**282**
		%	9,3	13,3	1,2	14,2	9,2	13,4	6,7	21,6	11,2	**100,0**

* Numbers below 10 000 are too small to provide reliable estimates

[28] The water quality questions were included for the first time in the GHS 2005

Table 15: Perceptions of households regarding the quality of municipal water, by province (numbers in thousands), 2005–2010 (concluded)

Year	Perceptions	Statis-tics	Province									
			WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2008	Not safe to drink	Number	34	47	10	44	19	25	29	69	19	**296**
		%	11,4	15,8	3,4	14,9	6,4	8,6	9,8	23,2	6,6	**100,0**
	Not clear	Number	50	67	14	50	21	37	35	84	22	**380**
		%	13,2	17,7	3,8	13,2	5,4	9,7	9,2	22,1	5,8	**100,0**
	Not good in taste	Number	55	70	19	48	20	33	45	71	62	**423**
		%	13,0	16,5	4,5	11,4	4,8	7,8	10,6	16,9	14,6	**100,0**
2009	Not free from bad smells	Number	60	61	8	42	44	36	74	75	19	**419**
		%	14,2	14,5	2,0	10,1	10,4	8,6	17,7	18,0	4,5	**100,0**
	Not clear	Number	32	46	16	68	55	29	46	106	13	**413**
		%	7,9	11,2	4,0	16,6	13,4	7,0	11,2	25,8	3,2	**100,0**
	Not Good in Taste	Number	42	104	19	68	45	31	53	90	29	**480**
		%	8,8	21,6	3,9	14,2	9,3	6,5	11,0	18,7	6,1	**100,0**
	Not Free from bad smells	Number	71	30	9	43	82	23	36	65	13	**371**
		%	19,2	8,0	2,4	11,5	22,0	6,2	9,7	17,4	3,5	**100,0**
2010	Not safe to drink	Number	12	36	19	41	42	39	41	114	23	**366**
		%	3,3	9,7	5,2	11,1	11,5	10,7	11,3	31,2	6,2	**100,0**
	Not clear	Number	19	73	26	59	51	44	47	123	28	**471**
		%	4,1	15,5	5,5	12,5	10,9	9,4	10,0	26,1	6,0	**100,0**
	Not Good in Taste	Number	32	115	26	52	47	47	61	126	68	**574**
		%	5,6	20,1	4,4	9,1	8,2	8,1	10,6	22,0	11,9	**100,0**
	Not Free from bad smells	Number	23	32	18	46	39	40	82	97	18	**395**
		%	5,8	8,2	4,6	11,6	10,0	10,1	20,6	24,6	4,6	**100,0**

* Numbers below 10 000 are too small to provide reliable estimates

Table 16: The number of water quality problems experienced by users of municipal water, by province (numbers in thousands), 2010

Number of problems	Statistics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
None	Number	1 379	1 135	224	719	2 123	620	3 431	699	934	**11 264**
	%	96,8	90,4	85,9	90,8	96,1	90,7	97,1	82,4	91,9	**93,7**
One	Number	29	42	13	15	41	17	45	19	59	**280**
	%	2,0	3,4	5,0	1,9	1,9	2,4	1,3	2,3	5,8	**2,3**
Two	Number	4	44	8	16	16	12	10	27	5	**142**
	%	0,3	3,5	3,0	2,0	0,7	1,8	0,3	3,2	0,5	**1,2**
Three	Number	3	13	5	14	11	10	26	24	8	**114**
	%	0,2	1,0	1,8	1,8	0,5	1,5	0,7	2,8	0,8	**1,0**
Four	Number	10	22	11	27	18	25	22	78	11	**225**
	%	0,7	1,7	4,4	3,4	0,8	3,6	0,6	9,3	1,1	**1,9**
Total	**Number**	**1 425**	**1 256**	**261**	**791**	**2 209**	**684**	**3 534**	**847**	**1 017**	**12 025**
	%	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**

* Numbers below 10 000 are too small to provide reliable estimates

Table 16 on the previous page shows that relatively few households nationally said that they had problems with one or more of the four dimensions of water quality measured in the questionnaire. The only provinces where significant percentages of households had one or more problems with water quality were: Mpumalanga (17,6%), Northern Cape (14,1%), North West (9,3%), Free State (9,2%) and Limpopo (8,1%).

Table 17: Predictors of quality problems of municipal water, by province using logistic regression[29], 2010[30]

Description of variable	Province									
	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Model indicators: Likelihood ratio chi square	42,584	88,887	95,546	175,456	52,719	80,747	136,814	238,298	10,298	741,650
N	2682	2052	1330	2045	3173	1675	3496	2145	2051	20649
Intercept	-3,141	-2,135	-2,525	-3,954	-2,648	-2,445	-0,696	-1,706	-2,720	-2,481
Maximum likelihood estimates										
Household size greater than 3.5	0,996	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**0,130**
Municipal water services rating: poor	2,507	1,564	1,927	2,450	1,323	1,566	1,736	1,769	0,604	1,730
RDP or higher toilet standard	-1,308	-0,575	n/a	-0,884	n/a	n/a	n/a	n/a	n/a	n/a
Rubbish removed at least once a week	n/a	0,769	0,463	1,142	n/a	n/a	-1,988	0,952	n/a	n/a
Connection to the mains electricity	n/a	n/a	n/a	**1,236**	-0,634	n/a	n/a	**-0,482**	n/a	n/a
Four or less rooms in dwelling	n/a	n/a	n/a	n/a	-0,801	-0,464	n/a	n/a	n/a	n/a
Dwelling fully or partially owned	n/a	n/a	n/a	n/a	n/a	n/a	-1,204	n/a	n/a	-0,228
Household receives at least one social grant	n/a	n/a	n/a	n/a	n/a	n/a	-0,950	n/a	n/a	n/a
Monthly expenditure R1800 or less	0,1904	n/a	3539	n/a	n/a	0,3424	n/a	-0,586	n/a	-0,253

n/a = values that are not significant at the 95% of 99% levels of significance are not reflected here.

[29] Dependent variable: Quality of water supply, value of 0 if no problems, 1 if one or more problems

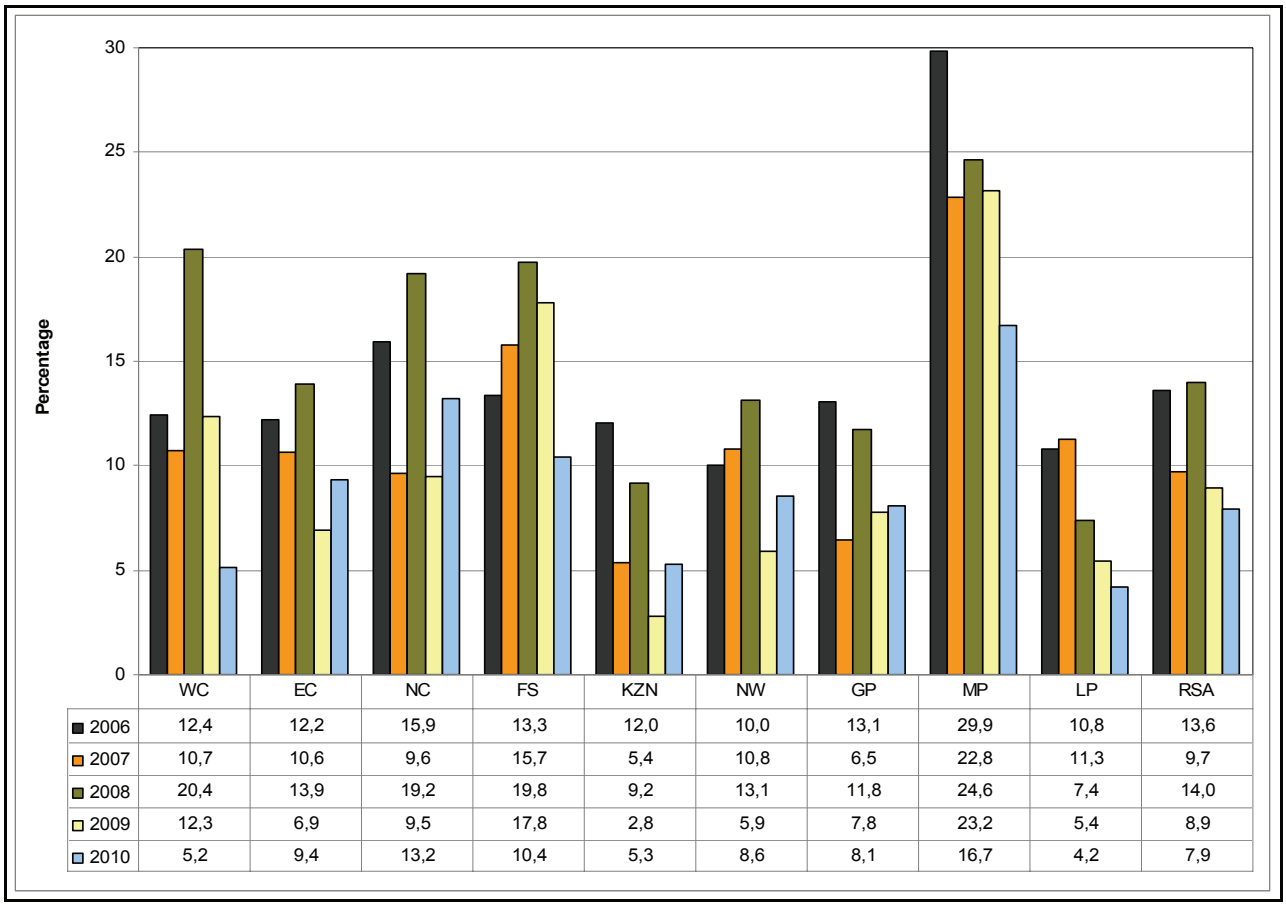
All provided estimates significant at 1% level except bolded estimates that are significant at 5% level

Also tested but not found significant: Female headed household, household head younger than 35 years, formal dwelling, number of rooms four or less, interruptions during the past 12 months

[30] The table provides the coefficients (m) for each factor that contributes towards the regression model (y=mx+c). The intercept (c) shows how steep the line is, where it will cross the y axis and whether the regression line leans forward or backward. The larger the coefficient the bigger is the relative contribution of that factor to the overall regression model. A negative coefficient means that the opposite of that factor has a relationship with the dependent variable (y). More details about the composition of variables can be found in Section 8

The positive predictors of poor quality of drinking water provided by municipalities on a national level include households size greater than 3,5 and 'poor municipal water services ratings'. Negative predictors include monthly expenditure of R1800 or less and dwelling fully or partially owned. In terms of predictors within provinces the only predictor shared amongst all provinces is the rating of municipal services as poor which is considered a positive predictor. Rubbish removed at least once a week is a positive predictor in Eastern Cape, Northern Cape, Free State and Mpumalanga, but a negative predictor in Gauteng. Toilets at RDP standard or higher are negative predictors in Western Cape, Eastern Cape and Free State. Monthly expenditure below R1800 are positive predictors in Western Cape, Northern Cape and North West, whilst it is a negative predictors in Mpumalanga.

Figure 12: Percentage of households that receive water from municipality and treat their water by boiling, adding chlorine or other chemicals or filtering before use, by province, 2006–2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2006	12,4	12,2	15,9	13,3	12,0	10,0	13,1	29,9	10,8	13,6
2007	10,7	10,6	9,6	15,7	5,4	10,8	6,5	22,8	11,3	9,7
2008	20,4	13,9	19,2	19,8	9,2	13,1	11,8	24,6	7,4	14,0
2009	12,3	6,9	9,5	17,8	2,8	5,9	7,8	23,2	5,4	8,9
2010	5,2	9,4	13,2	10,4	5,3	8,6	8,1	16,7	4,2	7,9

Figure 12 shows that in 2006, 13,6% of households in South Africa treated the water supplied by their municipalities. The largest percentage of households who treated municipal water was recorded in 2008, with 14,0%, but since then there has been a sharp decline to 7,9%. Mpumalanga had the highest percentages in all the years, reaching its peak of 29,9% in 2006 after which it decreased to 24,6% in 2008 and 16,7% in 2010. The treatment of water peaked across all other provinces (except Limpopo) during 2008. In 2010 Mpumalanga (16,7%), Northern Cape (13,2%) Free State (10,4%) and Western Cape were most likely to treat their water. Treatment was least likely to occur in Limpopo (4,2%), KwaZulu-Natal (5,3%) and Western Cape (5,2%). Treating municipal water was least likely to occur in Limpopo and its use appears to be decreasing annually. In 2007 it was 11,3% of households, which decreased to 7,4% in 2008, then to 5,4% in 2009 and to low of 4,2% in 2010. The rest of the provinces demonstarted no particular trends, just irregular fluctuations.

Table 18: Perceptions of households regarding the quality of non-municipal water, by province (numbers in thousands), 2005–2010[31]

Year	Perceptions	Statistics	Province									
			WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2005	Not safe to drink	Number	3	332	6	8	262	8	6	35	62	**722**
		%	0,4	45,9	0,9	1,1	36,3	1,1	0,9	4,8	8,5	**100,0**
	Not clear	Number	4	309	7	11	246	11	9	35	59	**691**
		%	0,6	44,8	1,0	1,5	35,7	1,6	1,3	5,1	8,6	**100,0**
	Not good in taste	Number	4	321	8	9	261	12	13	28	69	**725**
		%	0,6	44,2	1,1	1,2	36,0	1,7	1,8	3,9	9,6	**100,0**
	Not free from bad smells	Number	11	290	5	8	251	15	10	28	59	**677**
		%	1,6	42,9	0,8	1,1	37,1	2,3	1,6	4,1	8,6	**100,0**
2006	Not safe to drink	Number	3	271	12	6	251	24	6	54	53	**680**
		%	0,5	39,8	1,7	1,0	36,9	3,6	0,9	7,9	7,8	**100,0**
	Not clear	Number	4	254	13	6	238	27	8	61	45	**656**
		%	0,6	38,7	2,0	0,9	36,3	4,1	1,2	9,4	6,9	**100,0**
	Not good in taste	Number	5	263	16	6	250	27	11	57	70	**705**
		%	0,7	37,3	2,3	0,9	35,5	3,8	1,5	8,1	9,9	**100,0**
	Not free from bad smells	Number	9	237	9	7	239	31	9	53	50	**644**
		%	1,5	36,7	1,4	1,1	37,1	4,7	1,4	8,3	7,7	**100,0**
2007	Not safe to drink	Number	3	239	8	10	236	10	10	49	72	**637**
		%	0,5	37,5	1,2	1,6	37,0	1,5	1,6	7,7	11,3	**100,0**
	Not clear	Number	5	208	9	11	231	16	13	48	61	**601**
		%	1,2	38,3	1,8	1,4	30,6	4,2	1,5	10,4	10,5	**100,0**
	Not good in taste	Number	4	217	12	13	232	12	10	52	71	**623**
		%	0,7	34,9	1,9	2,1	37,3	2,0	1,5	8,3	11,4	**100,0**
	Not free from bad smells	Number	5	204	8	8	226	10	6	47	59	**573**
		%	0,9	35,6	1,3	1,5	39,5	1,8	1,1	8,1	10,2	**100,0**
2008	Not safe to drink	Number	9	295	10	13	243	32	12	57	84	**755**
		%	1,2	39,0	1,4	1,7	32,2	4,2	1,6	7,6	11,1	**100,0**
	Not clear	Number	8	276	13	10	221	30	11	75	76	**720**
		%	1,2	38,3	1,8	1,4	30,6	4,2	1,5	10,4	10,5	**100,0**
	Not Good in Taste	Number	9	269	11	10	226	42	17	72	97	**753**
		%	1,2	35,7	1,5	1,3	30,0	5,5	2,3	9,6	12,9	**100,0**
	Not free from bad smells	Number	5	253	9	10	221	40	19	64	88	**709**
		%	0,8	35,6	1,3	1,4	31,2	5,6	2,7	9,0	12,4	**100,0**
2009	Not safe to drink	Number	2	305	4	9	197	17	3	37	94	**668**
		%	0,4	45,6	0,6	1,4	29,5	2,6	0,4	5,5	14,1	**100,0**
	Not clear	Number	4	293	4	7	198	19	2	36	82	**645**
		%	0,6	45,4	0,7	1,0	30,6	2,9	0,4	5,6	12,8	**100,0**
	Not good in taste	Number	4	300	4	7	201	21	2	40	111	**690**
		%	0,6	43,4	0,6	1,1	29,1	3,0	0,4	5,9	16,0	**100,0**
	Not free from bad smells	Number	2	290	3	4	187	19	1	35	79	**620**
		%	0,3	46,7	0,6	0,6	30,2	3,1	0,1	5,7	12,8	**100,0**

[31] Unspecified excluded from denominator used to calculate percentages; Water quality questions were included for the first time in GHS 2006

Table 18: Perceptions of households regarding the quality non-municipal water, by province (numbers in thousands), 2005-2010 (concluded)

Year	Perceptions	Statistics	Provinces									
			WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2010	Not safe to drink	Number	2	311	21	11	255	25	10	44	73	**752**
		%	0,3	41,4	2,8	1,5	33,8	3,4	1,3	5,9	9,6	**100,0**
	Not clear	Number	5	303	21	13	202	23	11	45	60	**683**
		%	0,8	44,4	3,1	1,9	29,5	3,3	1,6	6,6	8,7	**100,0**
	Not good in taste	Number	3	302	21	13	187	42	8	46	93	**715**
		%	0,5	42,3	3,0	1,8	26,2	5,9	1,1	6,4	13,0	**100,0**
	Not free from bad smells	Number	2	249	19	12	185	19	9	41	60	**596**
		%	0,4	41,8	3,3	2,0	31,0	3,1	1,5	7,0	10,0	**100,0**

* Numbers below 10 000 are too small to provide reliable estimates

According to Table 18, most of the households sourcing non-municipal water sources in 2010, who are unhappy with the quality of their water and feel that their water is not safe to drink tend to reside in Eastern Cape (41,4%) and KwaZulu-Natal (33,8%). The same is true for those who say they do not have clear water (44,4% and 29,5%), water that does not taste good (42,3% and 26,2%) or has a bad smell (41,8% and 31%). The situation has remained largely unchanged since 2005.

Table 19: The number of water quality problems experienced by users of non-municipal water sources, by province (numbers in thousands), 2010[32]

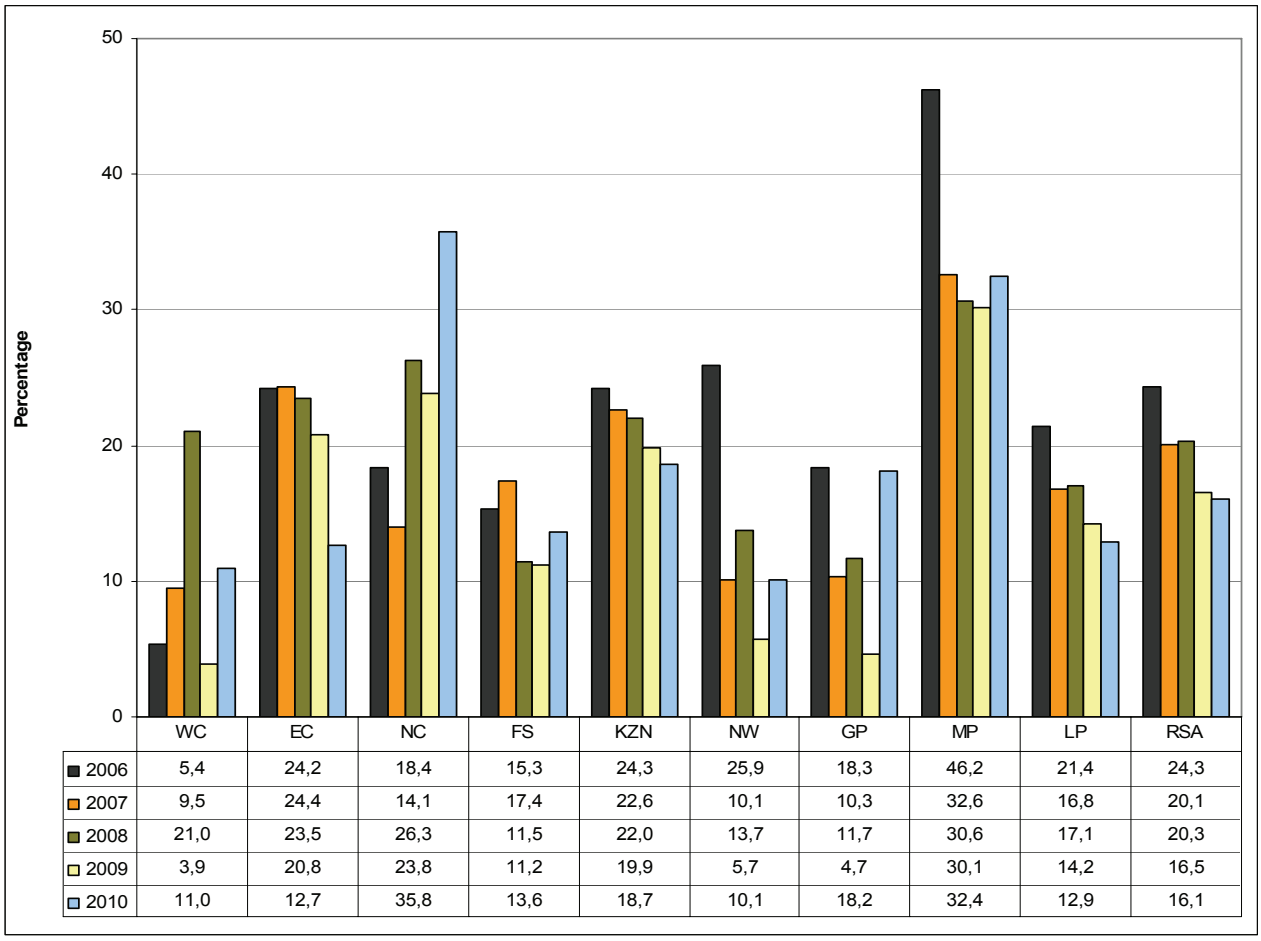
Number of problems	Statistics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
None	Number	96	140	34	59	195	212	94	100	245	**1175**
	%	93,4	28,0	61,3	78,7	41,1	81,2	84,1	63,7	68,7	**56,1**
One	Number	4	34	0	2	59	16	6	8	43	**172**
	%	3,8	6,8	0,0	2,1	12,4	6,3	5,6	5,1	12,1	**8,2**
Two	Number	1	54	0	3	37	15	5	10	11	**137**
	%	1,2	10,9	0,2	4,6	7,8	5,6	4,7	6,3	3,1	**6,5**
Three	Number	0	63	4	4	37	9	5	8	10	**139**
	%	0,0	12,6	7,0	4,8	7,8	3,5	4,2	4,8	2,9	**6,6**
Four	Number	2	209	18	7	146	9	2	31	47	**471**
	%	1,6	41,8	31,5	9,7	30,9	3,4	1,4	20,1	13,2	**22,5**
Total	Number	103	500	56	75	474	261	112	157	356	**2094**
	%	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	**100,0**

* Numbers below 10 000 are too small to provide reliable estimates

Table 19 summarises the number of water quality problems experienced by users of non-municipal water sources. As expected the proportion of users with one or more problems (43,9%) is much higher than that for municipal water users (6,3%). The provinces with the highest proportions of users with at least one problem were: Eastern Cape (72,0%), KwaZulu-Natal (58,9%), Northern Cape (38,7%) and Mpumalanga (36,3%).

[32] Unspecified problems excluded from calculations

Figure 13: Percentage of households who receive water from non-municipal water sources and whether the water is treated before use, by province, 2006–2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2006	5,4	24,2	18,4	15,3	24,3	25,9	18,3	46,2	21,4	24,3
2007	9,5	24,4	14,1	17,4	22,6	10,1	10,3	32,6	16,8	20,1
2008	21,0	23,5	26,3	11,5	22,0	13,7	11,7	30,6	17,1	20,3
2009	3,9	20,8	23,8	11,2	19,9	5,7	4,7	30,1	14,2	16,5
2010	11,0	12,7	35,8	13,6	18,7	10,1	18,2	32,4	12,9	16,1

In 2006, 24,3% of households who received water from non-municipal sources treated the water before drinking it (Figure 13). Even though there were slight fluctuations over time, there was a general downward trend to about 16,1% in 2010. Provinces such as Eastern Cape, Free State, KwaZulu-Natal, North West, Mpumalanga and Limpopo showed a decline in the percentage of households who treated their water. In 2006 there were several instances that may have led to the increase in sensitivity about diarrhoea. Even though there was no cholera outbreak there was a sharp increase during that year in deaths attributed to diarrhoea (Steyn 2010).

However, in Western Cape and Northern Cape there has been a increase in water treatment since 2006. This may be linked to increased fears, whether rational or not, about problems associated with unsafe water in the latter two provinces.

Table 20: Water service ratings against the treatment of water of users of municipal water (numbers in thousands), 2010[33]

Rating of water services	Statistics	Treat			Total
		Never	Yes, sometimes	Yes, always	
Average	Number	2 928	187	99	**3 214**
	Row percentage	91,1	5,8	3,1	**100,0**
	Column percentage	26,7	38,6	21,8	**-**
Good	Number	7 109	217	248	**7 574**
	Row percentage	93,9	2,9	3,3	**100,0**
	Column percentage	64,8	44,9	54,5	**-**
Poor	Number	934	80	108	**1 121**
	Row percentage	83,3	7,1	9,6	**100,0**
	Column percentage	8,5	16,5	23,7	**-**
Total		**10 971**	**483**	**456**	**11 909**

* Numbers below 10 000 are too small to provide reliable estimates

When considering water service ratings against the treatment of water (Table 20) it becomes evident that households who give a poor rating to their municipal services are significantly more likely to to treat their water than those who do not (likelihood ratio chi-square p<,0001). There is also a statistically significant relationship between water quality and treatment of water before drinking if treatement is divded into two dichotomous categories (treat/do not treat) and quality problems are divided into two categories (no problems/at least one problem) in that the odds are greater to treat water when there is a poor quality rating than otherwise (p<,0001). Only 5,6% of households who have no quality problems treat their water as opposed to 42,2% of households who have one or more quality problem. Table 21 gives a detailed breakdown of the nature of quality problems and the frequency of treatment.

Table 21: Water quality ratings against the treatment of water, (numbers in thousands), 2010[34]

Water quality	Statistics	Treatment of water before drinking			Total
		Never	Yes, sometimes	Yes, always	
Bad taste	Number	310	120	139	**570**
	%	54,4	21,1	24,4	**100,0**
Not clear	Number	39	15	5	**59**
	%	66,0	25,8	8,2	**100,0**
Not safe	Number	31	13	11	**55**
	%	56,4	23,2	20,4	**100,0**
Smelly	Number	57	13	3	**73**
	%	78,3	17,3	4,4	**100,0**
Total		**437**	**161**	**159**	**757**

* Numbers below 10 000 are too small to provide reliable estimates

[33] Unspecified problems excluded from calculations

[34] Unspecified problems excluded from calculations

5.2 Sanitation

Prior to 2010, DWA was responsible for national policy and strategic perspectives on sanitation. In January 2010, oversight of sanitation moved to the Department of Human Settlements. The DWA defines a basic sanitation facility as the infrastructure necessary to provide a sanitation facility which is safe, reliable, private and protected from the harsh weather conditions and which is ventilated and keep smells to the minimum. It should furthermore minimise the risk of the spread of sanitation-related diseases by facilitating the appropriate control of disease-carrying flies and pests, and enables safe and appropriate treatment and/or removal of human waste and waste water in an environmentally sound manner. Basic sanitation services is considered as the provision of a basic sanitation facility which is easily accessible to a household. Its sustainable operation include the safe removal of human waste and waste water from the premises, where this is appropriate and necessary, and the communication of good sanitation, hygiene and related practices. Toilet facilities of RDP standard or higher includes flush toilets connected to a sewerage network or septic tank as well as improved ventilated pit latrines.

Table 22: Type of toilet facility used by households (numbers in thousands)[35], 2002–2010

Type of toilet facility	Statistics	Year								
		2002	2003	2004	2005	2006	2007	2008	2009	2010
Flush toilet connected to a public sewage system in dwelling	Number	6 120	6 421	6 459	6 685	6 523	7 347	7 362	7 770	8 112
	%	55,6	56,5	55,2	55,4	52,4	57,4	55,4	56,3	58,7
Flush toilet connected to a septic tank	Number	216	247	436	493	1 048	494	564	400	467
	%	2,0	2,2	3,7	4,1	8,4	3,9	4,2	2,9	3,4
Chemical toilet	Number	36	43	50	117	54	78	62	50	59
	%	0,3	0,4	0,4	1,0	0,4	0,6	0,5	0,4	0,4
Pit latrine with ventilation pipe	Number	479	595	824	862	923	1 134	1 328	1 799	1 734
	%	4,4	5,2	7,0	7,2	7,4	8,9	10,0	13,0	12,5
Pit latrine without ventilation pipe	Number	2 770	2 757	2 679	2 730	2 850	2 747	2 938	2 846	2 595
	%	25,2	24,3	22,9	22,6	22,9	21,4	22,1	20,6	18,8
Bucket toilet	Number	278	241	235	269	291	220	198	147	110
	%	2,5	2,1	2,0	2,2	2,3	1,7	1,5	1,1	0,8
None	Number	1 103	1 052	1 022	904	770	791	831	760	728
	%	10,0	9,3	8,7	7,5	6,2	6,2	6,3	5,5	5,3
Other	Number	-	-	-	-	-	-	-	39	22
	%	-	-	-	-	-	-	-	0,3	0,2
Sub-total	Number	11 004	11 358	11 705	12 062	12 459	12 811	13 283	13 811	13 827
	%	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Unspecified	Number	9	4	7	13	0	90	13	1	478
	%	0,1	0,0	0,1	0,1	0,0	0,7	0,1	0,0	3,3
Total	**Number**	**11 013**	**11 362**	**11 712**	**12 075**	**12 459**	**12 901**	**13 296**	**13 812**	**14 305**

- Data not available

* Numbers below 10 000 are too small to provide reliable estimates

[35] The questions in the 2002 to 2008 questionnaires were structured slightly differently from the 2009 and 2010 questionnaires; the former also did not include the option 'Other'

Table 22 summarises the types of toilet facilities being used by South African households during the period 2002–2010. It shows that in 2010, more than half (58,7%) of households used flush toilets connected to a public sewerage system. The second and third most used toilet system nationally was a pit latrine without a ventilation pipe (18,8%) and pit latrines with ventilation pipes respectively (12,5%). Access to flush toilets connected to a public sewerage system in the dwelling has increased significantly over the reference period from 55,6% in 2002 to 58,7% in 2010. There has also been signs of pit latrine upgrades with a significant increase in pit latrines with ventilation pipes (from 4,4% in 2002 to 12,5% in 2010) and a decrease of pit latrines without ventilation pipes (from 25,2% to 18,8%). Households using no toilet facilities also decreased from 10,0% in 2002 to 5,3% in 2010.

Even though the government aims to eliminate the use of bucket toilets in practice they have found that as soon as it is eliminated in one settlement it is moved to other newer settlements. Even though its use is limited and has reduced from 2,5% to 0,8% over the reference period, it has not yet been completely eliminated.

Table 23: Type of toilet facility used, by province (numbers in thousands), 2010

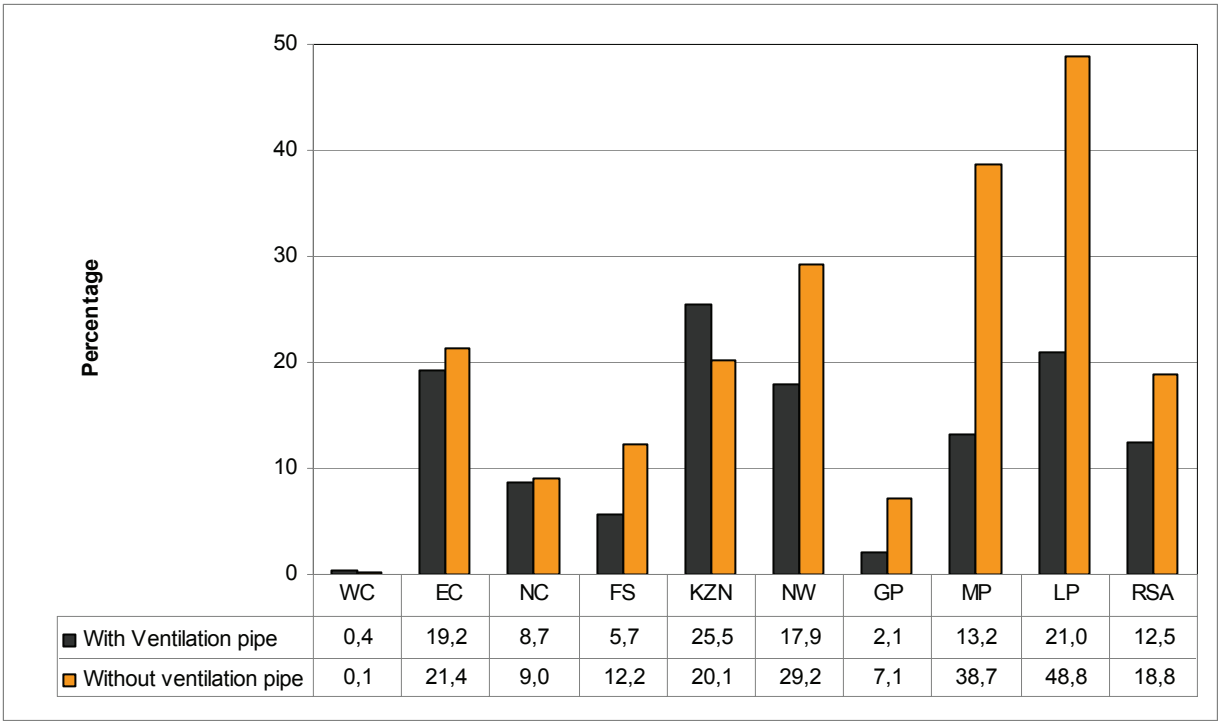
Type of toilet facility	Statistics	Year									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Flush toilet connected to a public sewage system in dwelling	Number	1 357	694	210	598	1 135	389	3 116	363	250	**8 112**
	%	90,4	40	68,7	73,8	43,6	40,6	87,2	37	18,4	**58,7**
Flush toilet connected to a septic tank	Number	84	40	16	13	104	74	61	40	34	**467**
	%	5,6	2,3	5,2	1,7	4	7,7	1,7	4,1	2,5	**3,4**
Chemical toilet	Number	6	2	4	3	20	1	19	1	3	**59**
	%	0,4	0,1	1,2	0,4	0,8	0,1	0,5	0,1	0,2	**0,4**
Pit latrine with ventilation pipe	Number	6	333	27	47	663	171	74	130	284	**1 734**
	%	0,4	19,2	8,7	5,7	25,5	17,9	2,1	13,2	21,0	**12,5**
Pit latrine without ventilation pipe	Number	1	370	27	99	524	280	253	380	662	**2 595**
	%	0,1	21,4	9	12,2	20,1	29,2	7,1	38,7	48,8	**18,8**
Bucket toilet	Number	26	15	3	36	10	0	17	2	0	**110**
	%	1,7	0,9	1,1	4,5	0,4	0	0,5	0,2	0	**0,8**
None	Number	19	276	18	13	148	41	27	65	120	**728**
	%	1,3	15,9	6	1,6	5,7	4,3	0,8	6,7	8,8	**5,3**
Other	Number	3	4	1	2	1	2	8	0	2	**22**
	%	0,2	0,2	0,2	0,2	0,1	0,2	0,2	0	0,2	**0,2**
Sub-total	Number	1 502	1 734	306	811	2 605	958	3 575	981	1 355	**13 827**
	%	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	**100,0**
Unspecified	Number	30	47	14	74	107	24	109	34	39	**478**
	%	2,0	2,6	4,4	8,4	3,9	2,4	3,0	3,3	2,8	**3,3**
Total	**Number**	**1 532**	**1 781**	**320**	**885**	**2 712**	**982**	**3 684**	**1 015**	**1 394**	**14 305**

* Numbers below 10 000 are too small to provide reliable estimates

In terms of type of toilet facility used within provinces, the GHS data reveals significant differences between provinces (Table 23). In 2010, the provinces with the highest, and above ational average levels of access to flush toilets connected to a public sewage system were: Western Cape (90,4%), Gauteng (87,2%) Free State (73,8%) and Northern Cape (68,7%). Even though the use of improved pit latrines has increased nationally since 2002, there are still some provinces with a high prevalence of sub standard sanitation facilities such as pit latrines

without ventilation pipes. The use of pit latrines in its various forms is most prevalent in Limpopo (69,8%), Mpumalanga (51,9%), KwaZulu-Natal (47,1%) and Eastern Cape (40,6%). In practice it is quite often expensive and difficult to install flush toilets everywhere, especially in areas that do not have a lot of water and/ or in dispersed settlements. The addition of ventilation pipes to pit latrines is a basic improvement to reduce smells and bacterial transmission through vectors such as flies.

Figure 14 Percentage of households using pit latrines with ventilation pipes and pit latrines without ventilation pipes, by province, 2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
With Ventilation pipe	0,4	19,2	8,7	5,7	25,5	17,9	2,1	13,2	21,0	12,5
Without ventilation pipe	0,1	21,4	9,0	12,2	20,1	29,2	7,1	38,7	48,8	18,8

Figure 14 shows to what extent individual provinces have made the transition from pit latrines without pipes to pit latrines with ventilation pipes. It is clear (with the exception of KwaZulu-Natal) that none of the other provinces with significant pit latrine use are successfully transitioning to improved pit latrines. KwaZulu-Natal is the only province where a greater proportion of households use pit latrines with a ventilation pipe than without a ventilation pipe (25,5% and 20,1% respectively). The trends in Limpopo, Mpumalanga and North West are particularly worrying as more than double the percentage in the former two provinces use pit latrines without ventilation pipes compared with those with ventilation pipes.

Table 24: Sanitation at RDP standard[36] or higher, by province (numbers in thousands), 2002–2010[37]

Year	Statistics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2002	Number	1 072	506	193	464	1 076	433	2 383	395	295	**6 816**
	%	92,1	34,1	75,4	65,2	51,9	54,7	89,0	51,4	27,3	**61,9**
2003	Number	1 082	536	199	492	1 233	500	2 489	438	296	**7 263**
	%	89,9	35,4	75,5	67,4	57,6	61,6	89,4	55,1	26,6	**64,0**
2004	Number	1 146	604	205	523	1 302	483	2 598	457	402	**7 719**
	%	92,2	39,0	76,0	69,8	59,0	58,1	89,9	55,7	35,0	**66,0**
2005	Number	1 199	740	220	537	1 378	473	2 656	411	426	**8 040**
	%	93,7	46,9	79,6	70,0	60,6	55,4	88,5	48,5	36,1	**66,7**
2006	Number	1 273	798	219	566	1 487	480	2 786	466	420	**8 494**
	%	95,6	49,5	77,2	72,0	63,2	54,7	89,1	53,2	34,6	**68,2**
2007	Number	1 294	857	237	608	1 573	561	2 855	526	466	**8 975**
	%	95,3	52,2	81,0	75,2	65,0	62,4	88,2	58,3	37,1	**70,1**
2008	Number	1 336	928	229	634	1 578	542	3 073	513	419	**9 253**
	%	93,9	54,8	76,3	76,2	62,9	58,7	91,3	54,6	32,4	**69,7**
2009	Number	1 402	1 008	260	675	1 819	627	3 109	519	551	**9 969**
	%	94,9	58,1	83,7	78,4	69,6	65,7	88,0	53,0	40,9	**72,2**
2010	Number	1446	1067	253	658	1901	634	3251	533	569	**10312**
	%	96,3	61,6	82,5	81,2	73,0	66,2	90,9	54,4	42,0	**74,6**

* Numbers below 10 000 are too small to provide reliable estimates

Table 24 summarises access to sanitation at RDP standard or higher for 2010 across all provinces between 2002 and 2010. It is clear that significant progress has been made in improving access to safer sanitation (from 61,9% in 2002 to 74,6% in 2010). However, certain provinces are still lagging behind, especially Limpopo (42,0%), Mpumalanga (54,4%) and Eastern Cape (61,6%). In terms of progress across time, the most significant improvements since 2002 have taken place in the following provinces in terms of percentage point increases:

- Eastern Cape (27,5%)
- KwaZulu-Natal (21,1%)
- Limpopo (14,7%)
- North West (11,5%)

Considering where they have started, both Eastern Cape and KwaZulu-Natal have evidently been very successful at upgrading the sanitation facilities of households living in their provinces.

[36] Flush toilet with on-site or off-site disposal as well as pit latrine with ventilation pipe regardless of location

[37] Unspecified excluded from denominator used to calculate percentages

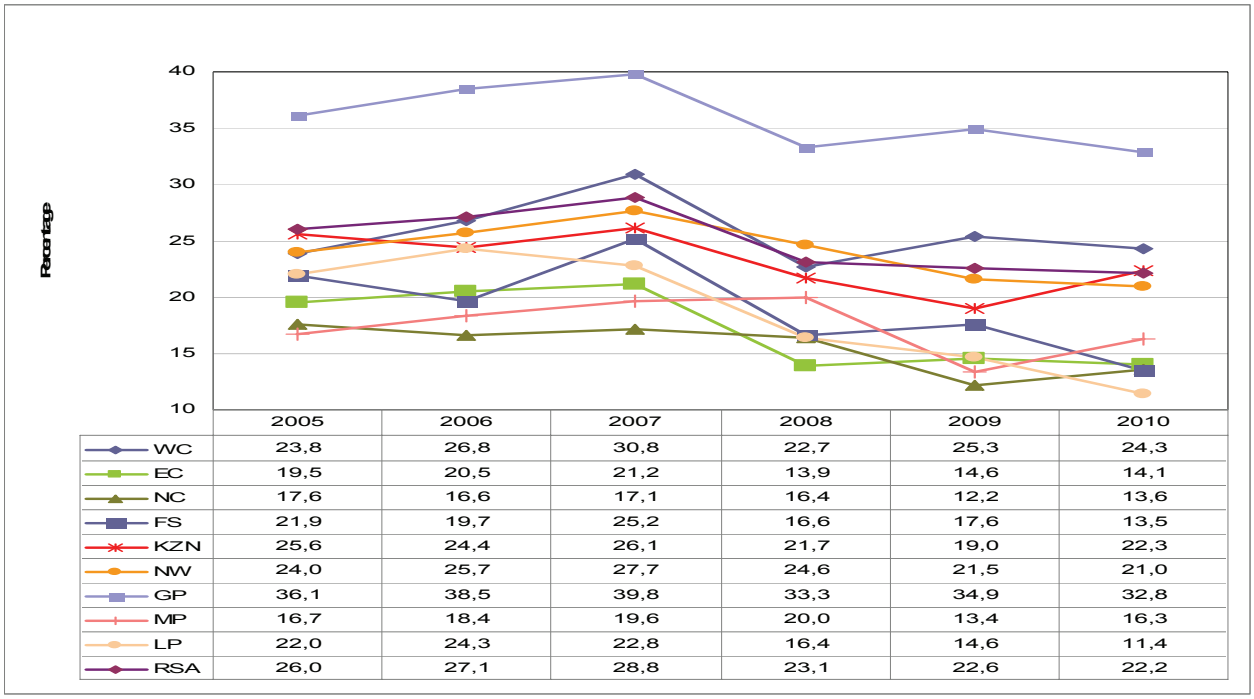
Table 25: Percentage of households who shared toilet facilities, by province, 2005–2010[38] [39]

Year	Province									
	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2005	23,8	19,5	17,6	21,9	25,6	24,0	36,1	16,7	22,0	**26,0**
2006	26,8	20,5	16,6	19,7	24,4	25,7	38,5	18,4	24,3	**27,1**
2007	30,8	21,2	17,1	25,2	26,1	27,7	39,8	19,6	22,8	**28,8**
2008	22,7	13,9	16,4	16,6	21,7	24,6	33,3	20,0	16,4	**23,1**
2009	25,3	14,6	12,2	17,6	19,0	21,5	34,9	13,4	14,6	**22,6**
2010	24,3	14,1	13,6	13,5	22,3	21,0	32,8	16,3	11,4	**22,2**

* Numbers below 10 000 are too small to provide reliable estimates

The table above shows the proportion of households in each province that share toilet facilities and the proportion that do not share, between 2005 and 2010. There has been a general downward trend in sharing sanitation facilities across the country from 26,0% to 22,2% during the reference period. Over time Gauteng had the highest percentage of households sharing toilet facilities, peaking at 39,8% in 2007 and then decreasing to 32,8% in 2010. Other provinces that had more than 15% of households sharing toilet facilities in 2010 were: Western Cape (24,3%), KwaZulu-Natal (22,3%), North West (21,0%) and Mpumalanga (16,3%).

Figure 15: Percentage of households who share toilet facilities, by province, 2005–2010



	2005	2006	2007	2008	2009	2010
WC	23,8	26,8	30,8	22,7	25,3	24,3
EC	19,5	20,5	21,2	13,9	14,6	14,1
NC	17,6	16,6	17,1	16,4	12,2	13,6
FS	21,9	19,7	25,2	16,6	17,6	13,5
KZN	25,6	24,4	26,1	21,7	19,0	22,3
NW	24,0	25,7	27,7	24,6	21,5	21,0
GP	36,1	38,5	39,8	33,3	34,9	32,8
MP	16,7	18,4	19,6	20,0	13,4	16,3
LP	22,0	24,3	22,8	16,4	14,6	11,4
RSA	26,0	27,1	28,8	23,1	22,6	22,2

[38] 'None', 'Other' and 'Unspecified' toilet facility responses as well as unspecified sharing were excluded from denominator used to calculate percentages

[39] This question was included for the first time in GHS 2005.

The sharing of toilet facilities as depicted in Table 25 and Figure 15 is often related to not having a toilet in the dwelling and/or yard. Table 26 below shows that households living in informal dwellings in the backyard and households living in standalone informal dwellings are significantly more likely than other dwelling types to make use of shared toilet facilities.

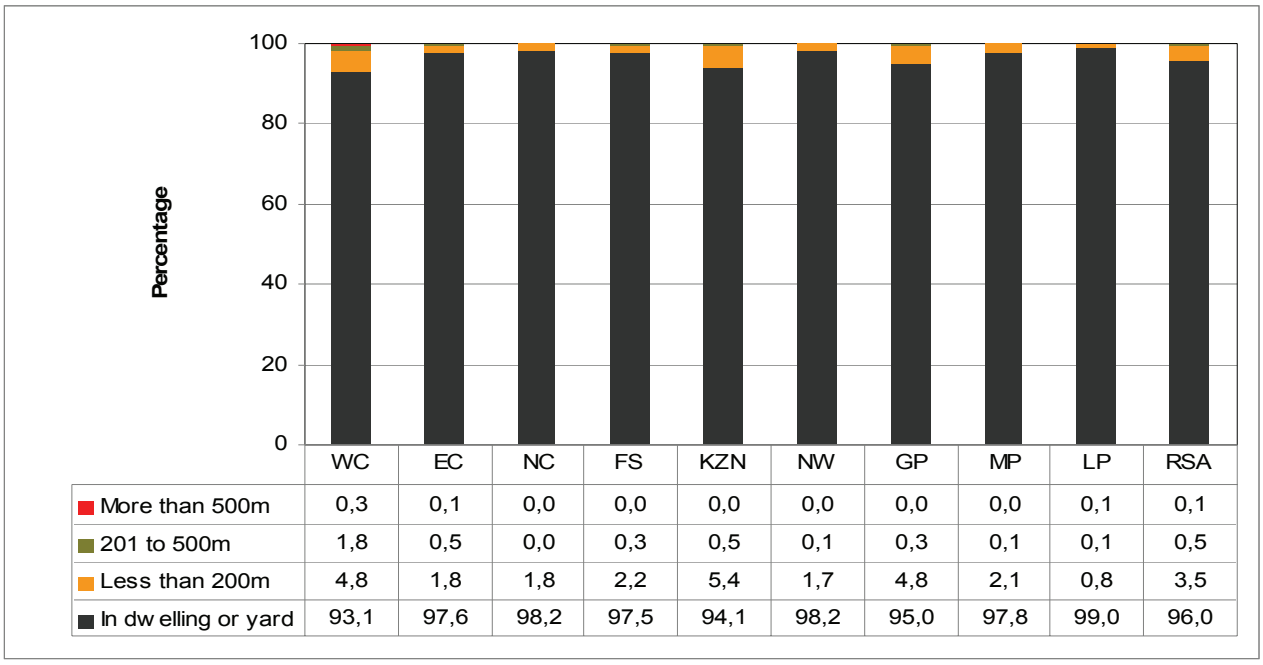
Table 26: Households sharing toilet facilities by housing type and province (numbers in thousands), 2010

Housing type	Statis-tics	Province									
		WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Formal	Number	116	118	31	64	234	111	308	93	108	1 182
	%	12,1	13,1	12,4	9,3	15,0	15,2	14,5	12,1	9,3	12,9
Informal backyard	Number	92	31	3	16	107	38	231	20	13	549
	%	77,8	38,8	18,4	27,5	70,8	38,4	60,5	25,7	61,8	55,0
Informal standalone	Number	110	14	4	18	18	37	323	12	10	547
	%	91,3	91,2	63,5	33,8	64,9	53,2	86,2	79,2	66,1	78,2
Traditional	Number	2	21	1	3	73	1	1	12	5	119
	%	80,3	5,2	9,9	13,3	15,3	13,4	100,0	27,0	10,7	11,7
Other	Number	9	1	0	0	9	0	14	4	0	38
	%	64,8	31,7	10,3	4,8	96,0	100,0	92,2	94,4	0,0	68,0

* Numbers below 10 000 are too small to provide reliable estimates

Figure 16 shows that in 2010, 4% of households did not have a toilet facility within their dwelling or yard. Toilets outside the yard, but less than 200 metres from the dwelling were most likely to be found in KwaZulu-Natal (5,4%), Western Cape (4,8%) and Gauteng (4,8%).

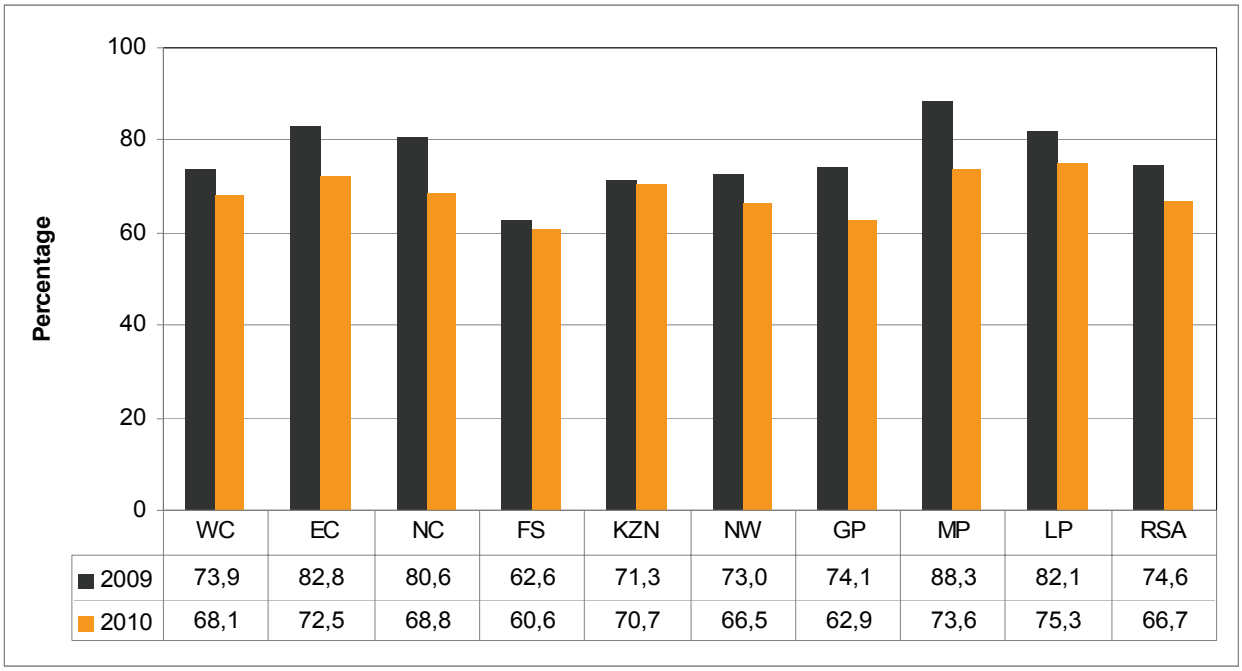
Figure 16: Percentage of households who have a toilet facility in their dwelling/yard and those who have to walk to reach a toilet facility and the distance travelled, 2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
More than 500m	0,3	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,1
201 to 500m	1,8	0,5	0,0	0,3	0,5	0,1	0,3	0,1	0,1	0,5
Less than 200m	4,8	1,8	1,8	2,2	5,4	1,7	4,8	2,1	0,8	3,5
In dw elling or yard	93,1	97,6	98,2	97,5	94,1	98,2	95,0	97,8	99,0	96,0

Figure 17 demonstrates that there has been a decrease from 2009 to 2010 in the proportion of households who pay for their connection to a public sewerage system from 74,6% to 66,7%. This trend is visible in all provinces with the biggest percentage point decreases in Mpumalanga (14,8%), Northern Cape (11,8%), Gauteng (11,3%) and Eastern Cape (10.3%).

Figure 17: Percentage households who are connected to a public sewerage system and pay for the connection, 2009–2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
2009	73,9	82,8	80,6	62,6	71,3	73,0	74,1	88,3	82,1	74,6
2010	68,1	72,5	68,8	60,6	70,7	66,5	62,9	73,6	75,3	66,7

5.2.1 Water supply to informal dwellings

Table 27: Informal housing types by kind of toilet facility used (numbers in thousands), 2010[40]

Province	Housing type	Statis-tics	Toilet facility								
			Flush connected to sewage	Flush septic tank	Chemi-cal	Pit latrine with vent	Pit latrine without vent	Bucket toilet	None	Other	Total
RSA	Informal alone	Number	347	18	19	111	351	65	103	8	**1 022**
		%	34,0	1,7	1,9	10,9	34,3	6,4	10,1	0,8	**100,0**
	Informal back-yard	Number	531	9	4	36	86	15	29	2	**712**
		%	74,6	1,2	0,6	5,1	12,1	2,1	4,1	0,3	**100,0**
	Other	Number	7 233	440	36	1587	2 158	30	596	12	**12 092**
		%	59,8	3,6	0,3	13,1	17,9	0,3	4,9	0,1	**100,0**
WC	Informal alone	Number	82	3	1	3	1	20	14	1	**124**
		%	66,0	2,4	0,5	2,1	0,7	16,3	10,9	1,0	**100,0**
	Informal back-yard	Number	118	1	1	0	0	2	2	1	**123**
		%	95,3	0,5	0,4	0,0	0,0	1,2	1,5	1,0	**100,0**
	Other	Number	1157	80	5	3	0	4	4	0	**1 254**
		%	92,3	6,4	0,4	0,3	0,0	0,3	0,3	0,0	**100,0**
EC	Informal alone	Number	29	3	0	1	30	11	28	3	**106**
		%	27,5	3,0	0,5	0,6	28,7	10,9	26,2	2,8	**100,0**
	Informal back-yard	Number	12	2	0	1	1	0	3	0	**20**
		%	60,4	10,9	0,0	4,8	6,8	0,0	17,1	0,0	**100,0**
	Other	Number	653	35	2	331	339	4	245	1	**1 608**
		%	40,6	2,2	0,1	20,6	21,1	0,2	15,2	0,0	**100,0**
KZN	Informal alone	Number	35	1	0	37	49	10	11	0	**143**
		%	24,3	0,5	0,0	26,0	34,7	6,9	7,7	0,0	**100,0**
	Informal back-yard	Number	6	0	1	14	4	0	4	0	**29**
		%	20,7	0,0	2,1	47,8	14,8	0,0	14,6	0,0	**100,0**
	Other	Number	1 094	103	19	612	470	0	133	1	**2 432**
		%	45,0	4,2	0,8	25,2	19,3	0,0	5,5	0,1	**100,0**

[40] Northern Cape, Free State, Mpumalanga and Limpopo have been grouped together as 'Other' as a result of the small numbers living in informal dwellings not in backyard in these provinces

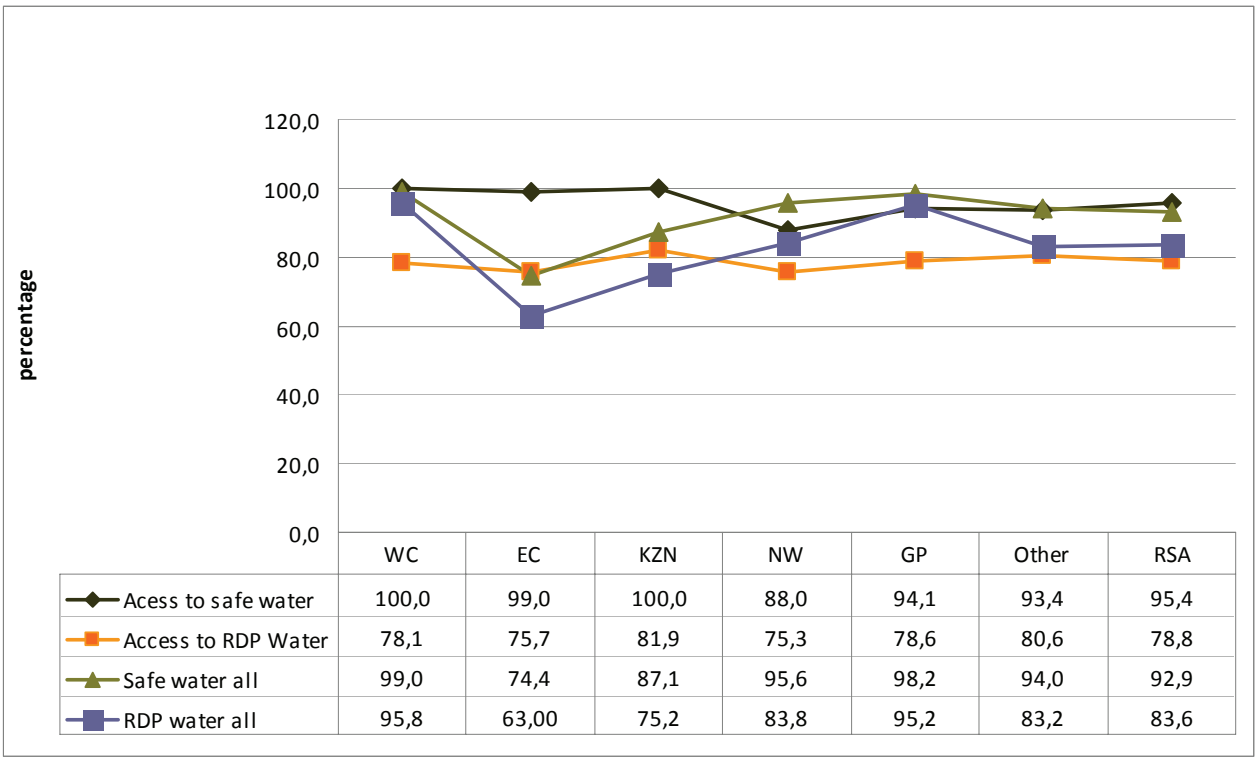
Table 27: Informal Housing types by kind of toilet facility used (numbers in thousands), 2010

Prov-ince	Housing type	Statis-tics	Toilet type								
			Flush connect ed to sewage	Flush septic tank	Chemi-cal	Pit latrine with vent	Pit latrine without vent	Bucket toilet	None	Other	Total
GP	Informal alone	Number	107	9	17	47	153	12	17	2	**364**
		%	29,5	2,4	4,6	12,9	42,0	3,2	4,7	0,7	**100,0**
	Informal back-yard	Number	320	3	2	3	30	4	7	0	**370**
		%	86,6	0,8	0,7	0,9	8,2	1,0	1,8	0,0	**100,0**
	Other	Number	2 688	49	0	23	69	2	3	6	**2 841**
		%	94,6	1,7	0,0	0,8	2,4	0,1	0,1	0,2	**100,0**
Other	Informal alone	Number	57	1	2	15	69	12	23	0	**179**
		%	32,0	0,7	0,8	8,1	38,3	6,8	13,0	0,1	**100,0**
	Informal back-yard	Number	56	1	1	3	18	9	8	0	**96**
		%	58,8	1,3	0,6	2,7	18,6	9,8	8,4	0,0	**100,0**
	Other	Number	1 308	101	9	470	1 081	20	185	5	**3 180**
		%	41,1	3,2	0,3	14,8	34,0	0,6	5,8	0,1	**100,0**

* Numbers below 10 000 are too small to provide reliable estimates

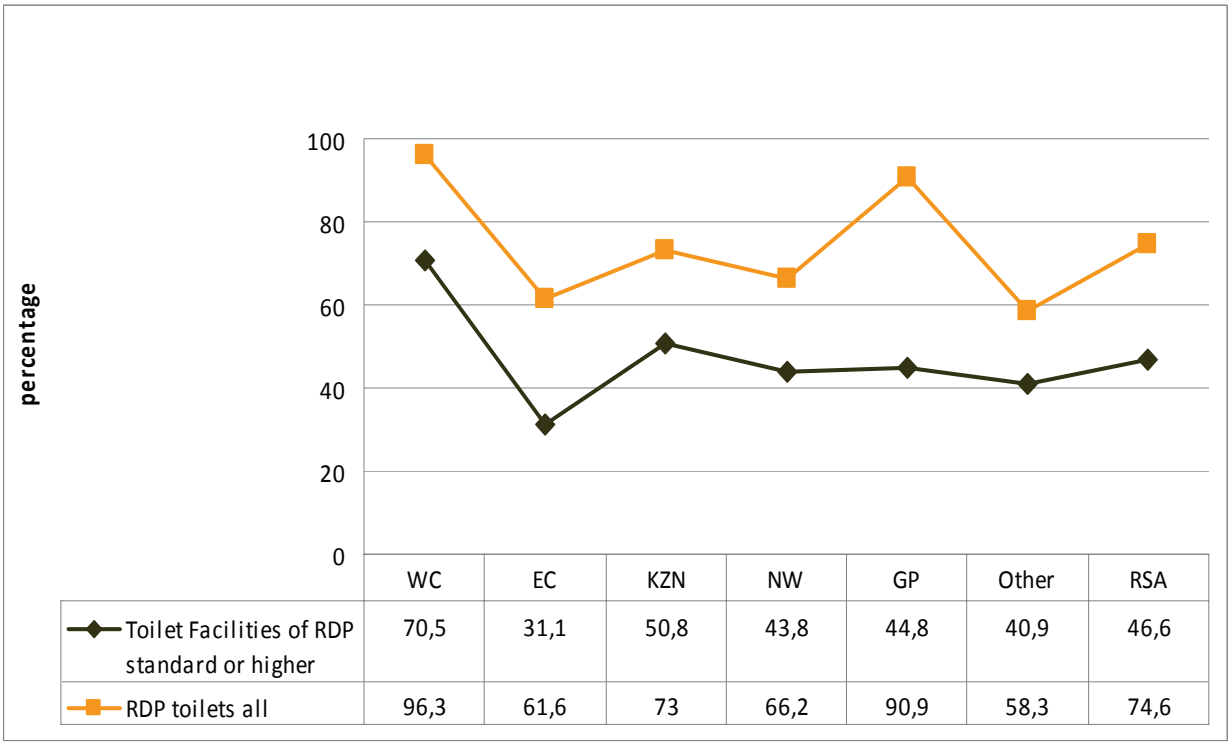
In the question on dwelling types the GHS questionnaire distinguishes between informal dwellings in the backyard and informal dwellings not in backyards. Since the informal dwellings in backyards are dependent on and in most cases make use of the services provided to the main dwelling, this particular dwelling type is not considered in this discussion. The focus in this section is therefore on standalone informal dwellings. Table 28 and Figures 18 and 19 summarizes the water and sanitation profiles of these types of households.

Figure 18: Percentage of households living in informal dwellings not in backyard that have access to safe water and RDP water respectively compared with the general population, 2010[41]



	WC	EC	KZN	NW	GP	Other	RSA
Acess to safe water	100,0	99,0	100,0	88,0	94,1	93,4	95,4
Access to RDP Water	78,1	75,7	81,9	75,3	78,6	80,6	78,8
Safe water all	99,0	74,4	87,1	95,6	98,2	94,0	92,9
RDP water all	95,8	63,00	75,2	83,8	95,2	83,2	83,6

Figure 19: Percentage of households living in informal dwellings not in backyard that have access to toilet facilities of RDP standard or higher compared with the general population, 2010



	WC	EC	KZN	NW	GP	Other	RSA
Toilet Facilities of RDP standard or higher	70,5	31,1	50,8	43,8	44,8	40,9	46,6
RDP toilets all	96,3	61,6	73	66,2	90,9	58,3	74,6

[41] Northern Cape, Free State, Mpumalanga and Limpopo have been grouped together as 'Other' as a result of the small numbers living in informal dwellings not in backyard in these provinces

Table 28: Water and sanitations indicators for households living in informal dwellings not in the backyard, 2010[42]

Variable	Category	Statistics	WC	EC	KZN	NW	GP	Other	RSA
Number of households		Number	134	111	164	109	409	196	**1 123**
		%	11,9	9,9	14,6	9,7	36,4	17,5	**100,0**
Access to safe water	Yes	Number	134	110	164	96	384	183	**1 071**
		%	100,0	99,0	100,0	88,0	94,1	93,4	**95,4**
Access to RDP water	Yes	Number	105	84	134	82	321	158	**884**
		%	78,1	75,7	81,9	75,3	78,6	80,6	**78,8**
Distance to water	Less than 200m	Number	66	73	79	39	203	56	**516**
		%	53,7	72,7	49,8	37,8	56,6	30,1	**50,1**
	201–500 metres	Number	17	15	21	11	19	16	**100**
		%	13,8	15,3	13,5	10,4	5,4	8,6	**9,7**
	501m –1 km	Number	2	0	3	2	3	2	**12**
		%	1,5	0,5	1,8	1,9	0,8	1,3	**1,2**
	More than 1 km	Number	0	0	0	0	1	1	**2**
		%	0,0	0,0	0,0	0,4	0,2	0,5	**0,2**
	Water access in dwelling or yard	Number	38	11	55	52	133	110	**400**
		%	31,0	11,5	34,8	49,5	37,1	59,4	**38,8**
Water quality	Safe to drink	Number	133	110	162	103	399	178	**1 085**
		%	99,7	99,0	98,7	94,5	97,7	91,2	**96,8**
	Clear/free of mud	Number	132	109	161	102	392	173	**1 068**
		%	99,1	97,8	97,9	93,6	96,1	88,6	**95,3**
	Good in taste	Number	133	108	163	103	389	172	**1 067**
		%	99,7	97,5	99,3	94,6	96,0	88,7	**95,7**
	Free from bad smells	Number	127	111	163	103	358	179	**1 041**
		%	95,1	100,0	99,3	94,8	88,5	91,8	**93,2**
Number of quality problems	0 problems	Number	127	108	160	101	360	169	**1 025**
		%	94,5	97,5	97,3	93,1	88,2	85,9	**91,3**
	1 problem	Number	7	0	3	1	28	7	**46**
		%	5,1	0,3	2,0	1,0	6,9	3,4	**4,1**
	2 problems	Number	0	1	0	1	5	5	**12**
		%	0,0	1,1	0,0	0,8	1,2	2,5	**1,1**
	3 problems	Number	0	1	0	0	10	3	**15**
		%	0,0	1,0	0,0	0,4	2,5	1,6	**1,3**
	4 problems	Number	0	0	1	5	5	13	**25**
		%	0,3	0,0	0,7	4,7	1,2	6,5	**2,2**

* Numbers below 10 000 are too small to provide reliable estimates

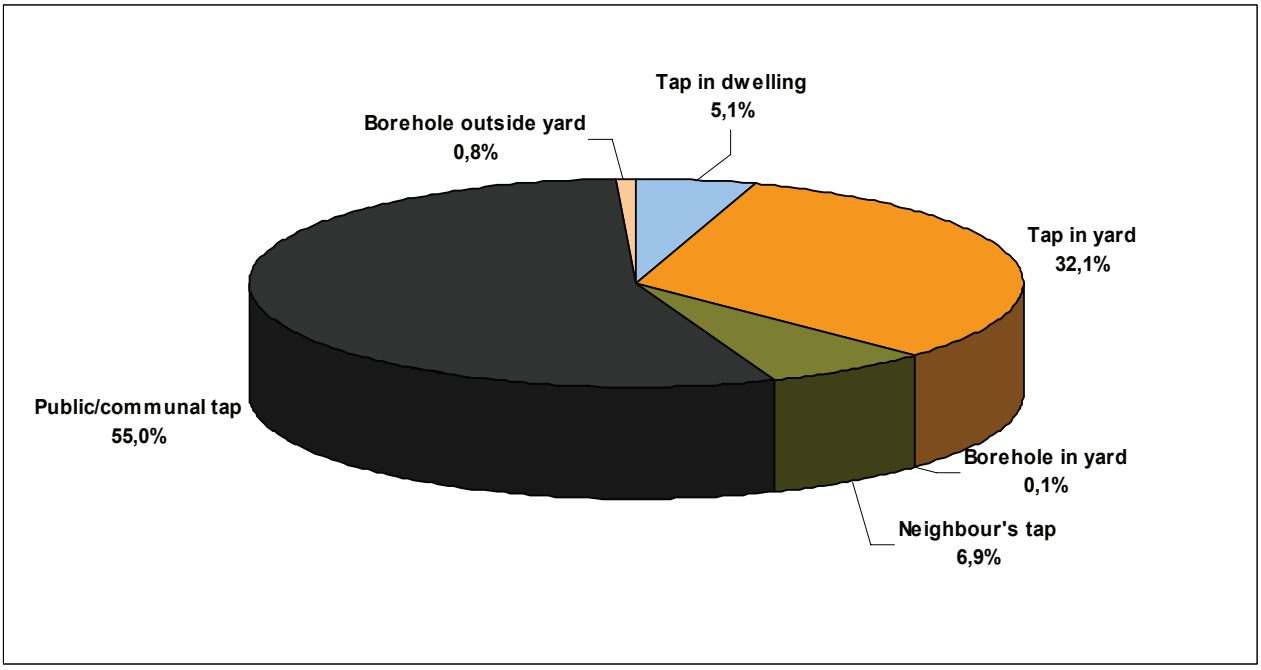
[42] Northern Cape, Free State, Mpumalanga and Limopop have been grouped together as “Other’ as a result of small numbers living in informal dwellings not in backyard in these provinces

Table 28: Water and sanitation indicators for households living in informal dwellings not in the backyard, 2010 (concluded)

Variable	Category	Statistics	WC	EC	KZN	NW	GP	Other	RSA
Pay for municipal water	Yes	Number	16	11	12	20	33	35	**128**
		%	12,6	10,6	7,5	25,0	8,5	20,7	**12,3**
Treat water	Yes, always	Number	0	0	4	2	11	10	**27**
		%	0,0	0,0	2,2	1,5	2,8	5,1	**2,4**
	Yes, sometimes	Number	1	1	6	4	10	16	**39**
		%	0,5	1,3	3,9	3,8	2,4	8,3	**3,5**
	No, never	Number	133	110	154	103	385	169	**1 053**
		%	99,5	98,7	93,9	94,7	94,8	86,5	**94,2**
Type of toilet facilities	Flush toilet connected to a public sewage system in dwelling	Number	82	29	35	37	107	57	**347**
		%	66,0	27,5	24,3	34,6	29,5	32,0	**34,0**
	Flush toilet connected to a septic tank	Number	3	3	1	1	9	1	**18**
		%	2,4	3,0	0,5	0,7	2,4	0,7	**1,7**
	Chemical toilet	Number	1	0	0	0	17	1	**19**
		%	0,5	0,5	0,0	0,0	4,6	0,8	**1,9**
	Pit latrine with ventilation pipe	Number	3	1	37	9	47	14	**111**
		%	2,1	0,6	26,0	8,5	12,9	8,1	**10,9**
	Pit latrine without ventilation pipe	Number	1	30	49	49	153	68	**351**
		%	0,7	28,7	34,7	45,9	42,0	38,3	**34,3**
	Bucket toilet	Number	20	11	10	0	12	12	**65**
		%	16,3	10,9	6,9	0,0	3,2	6,8	**6,4**
	None	Number	14	28	11	10	17	23	**103**
		%	10,9	26,2	7,7	9,4	4,7	13,0	**10,1**
	Other	Number	1	3	0	1	2	0	**8**
		%	1,0	2,8	0,0	0,8	0,7	0,1	**0,8**
Toilet facilities of RDP standard or higher	Yes	Number	88	33	73	47	163	73	**476**
		%	70,5	31,1	50,8	43,8	44,8	40,9	**46,6**

* Numbers below 10 000 are too small to provide reliable estimates

Figure 20: Percentage distribution of the kind of water sources used by households who have access to safe water sources and live in an informal dwelling, not in backyards, 2010



More than half (55,0%) of the informal dwelling units not in backyards that have access to safe water, access their piped water from a public/communal tap. A further 32,1% have piped water in the yard. Only 5,1% of informal dwelling units, who are not in backyards, have access to piped water in the dwelling, and 6,9% of informal households use their neighbour's tap for water (Figure 20).

The percentage of households living in informal dwellings with access to piped water has been at levels of around 93,9% throughout the years from 2002 to 2010. The Western Cape showed the highest percentage of informal dwellings that had access to piped water between the years 2002 and 2005, with an average percentage of 99,6% in that period. Gauteng had the second highest percentage of informal dwellings with such access between 2003 and 2004, but from 2005 to 2007, the percentage of households living in informal dwellings in the Eastern Cape was the second highest in the country. In 2008 KwaZulu-Natal (99,5%) had the highest percentage of households living in informal dwellings with access to piped water, and again in 2010 – jointly with Western Cape it remained the province with the highest percentage of informal dwellings with access to piped water.

Mpumalanga (83,6%) had the lowest percentage of households living in informal dwellings with access to piped water in 2002, while Limpopo (84,8%) and North West (86,4%) showed the second and third lowest percentage, respectively. Limpopo dropped sharply to nearly 80% in 2003 and then to 61% in 2004, which made it the province with the lowest percentage of informal dwelling households with access to piped water in 2004.

Mpumalanga (84,9%) had the lowest percentage of households in informal dwellings with access to piped water in 2010, informal dwellings in the North West (86,4%) were the second least likely to have access to piped water in 2010, with Limpopo (86,5%) being the province with the third lowest percentage of informal dwellings with access to piped water.

5.2.2 Water supply and sanitation of households living on land classified as tribal land

Water and sanitation problems are biggest in rural tribal areas, that formerly formed part of the TBVC states. Most of these settlements are on land classified by the Surveyor General as tribal land. These areas are characterised by high levels of poverty and dependence on social grants and poor access to basic services. Table 30 on the next page summarises the main water and sanitation characteristics of households living in these settlements. It is evident from the table that the water and sanitation situation in these areas is significantly poorer than in the country as a whole, especially in relation to sanitation.

Table 29: Water and sanitation indicators for households living on land classified as tribal land, 2010[43] [44]

Variable	Category	Statistics	EC	KZN	NW	MP	LP	Other	RSA
Number of households		Number	863	1034	452	457	1 088	155	**4 049**
		%	21,3	25,5	11,2	11,3	26,9	3,8	**100,0**
Access to safe water	Yes	Number	441	735	416	411	989	154	**3146**
		%	51,0	71,1	92,0	90,1	90,9	99,4	**77,7**
Traditional dwelling	Safe water	Number	438	508	21	39	154	79	**1 239**
		%	42,0	61,1	100,0	83,0	89,5	100,0	**56,5**
	Unsafe water sources	Number	29	33	0	1	1	0	**64**
		%	2,8	4,0	0,0	2,1	0,6	0,0	**2,9**
	Other sources	Number	577	290	0	7	17	0	**891**
		%	55,3	34,9	0,0	14,9	9,9	0,0	**40,6**
Other dwellings	Safe water	Number	307	730	990	1 084	2 093	427	**5 631**
		%	62,9	78,7	95,7	90,6	93,4	99,5	**89,1**
	Unsafe water sources	Number	43	37	33	40	23	2	**178**
		%	8,8	4,0	3,2	3,3	1,0	0,5	**2,8**
	Other sources	Number	138	161	12	72	126	0	**509**
		%	28,3	17,4	1,2	6,0	5,6	0,0	**8,1**
Distance to water	Less than 200m	Number	252	230	125	90	331	40	**1 068**
		%	30,6	23,2	29,1	20,4	32,3	26,8	**27,7**
	201–500 m	Number	224	260	67	58	172	8	**789**
		%	27,3	26,2	15,7	13,2	16,8	5,6	**20,5**
	501m –1 km	Number	154	99	17	11	61	1	**343**
		%	18,7	10,0	4,1	2,5	6,0	0,5	**8,9**
	More than 1 km	Number	105	58	2	2	17	0	**185**
		%	12,8	5,9	0,6	0,6	1,7	0,0	**4,8**
	Water access in dwelling or yard	Number	87	343	217	280	443	101	**1 473**
		%	10,6	34,7	50,6	63,4	43,3	67,1	**38,2**
Water quality	Safe to drink	Number	535	783	422	419	1003	150	**3 313**
		%	62,3	76,5	93,8	92,5	92,9	97,9	**82,5**
	Clear/free of mud	Number	551	831	416	408	1 014	149	**3 369**
		%	64,3	81,2	92,4	90,0	94,0	96,9	**83,9**
	Good in taste	Number	535	836	410	405	950	146	**3 282**
		%	62,5	81,7	91,0	89,3	88,1	95,2	**81,7**
	Free from bad smells	Number	600	843	417	418	1 008	148	**3 434**
		%	70,0	82,4	92,8	92,0	93,6	96,3	**85,5**

* Numbers below 10 000 are too small to provide reliable estimates

[43] Unspecified excluded from denominator used to calculate percentages.

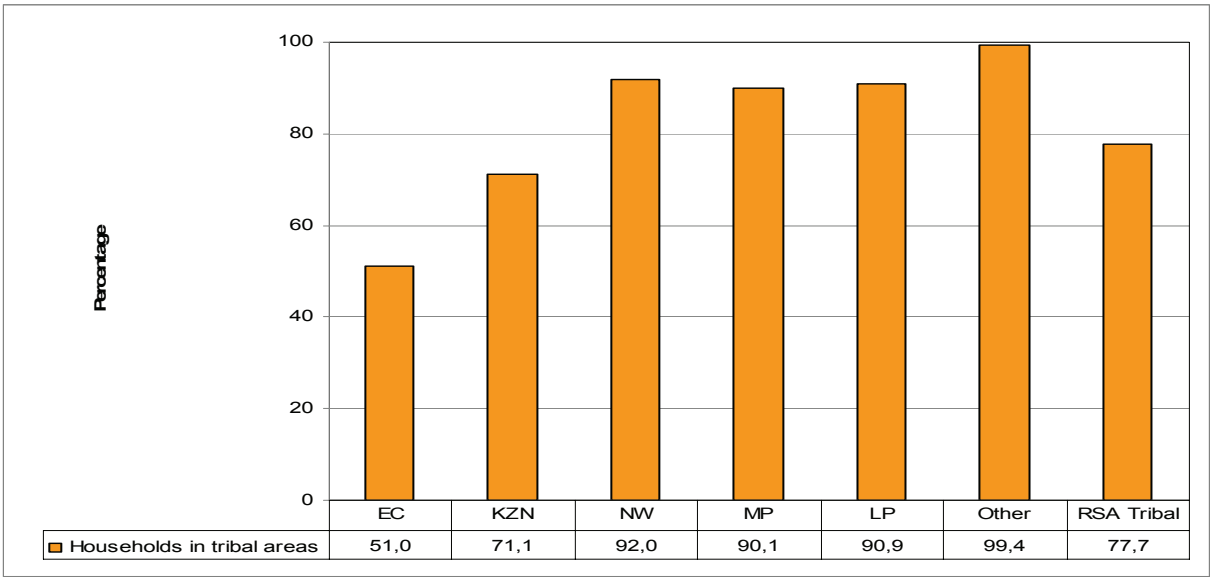
[44] The Western Cape has no tribal land. Provinces with low numbers of households living on tribal land i.e. Free State, Northern Cape and Gauteng were grouped together into the category 'Other'.

Table 29: Water and sanitation indicators for households living on land classified as tribal land (concluded)

Variable	Category	Statistics	EC	KZN	NW	MP	LP	Other	RSA
Number of quality problems	0 problems	Number	487	758	401	394	933	143	**3 116**
		%	56,5	73,3	88,5	86,2	85,8	92,5	**77,0**
	1 problem	Number	42	69	15	15	79	7	**226**
		%	4,8	6,6	3,3	3,3	7,3	4,5	**5,6**
	2 problems	Number	53	32	10	18	15	1	**130**
		%	6,1	3,1	2,3	4,0	1,4	0,7	**3,2**
	3 problems	Number	65	34	6	5	11	3	**125**
		%	7,6	3,3	1,4	1,1	1,0	2,0	**3,1**
	4 problems	Number	216	142	20	24	49	1	**452**
		%	25,0	13,7	4,4	5,3	4,5	0,5	**11,2**
Treat water	Yes, always	Number	20	26	13	22	25	8	**114**
		%	2,4	2,5	2,9	4,8	2,4	5,1	**2,8**
	Yes, sometimes	Number	43	79	21	39	42	3	**226**
		%	5,0	7,8	4,6	8,5	3,9	2,0	**5,7**
	No, never	Number	793	914	415	393	1010	142	**3 668**
		%	92,6	89,7	92,5	86,7	93,7	92,9	**91,5**
Type of toilet facilities	Flush toilet connected to a public sewage system in dwelling	Number	3	23	15	20	46	3	**111**
		%	0,4	2,4	3,5	4,6	4,4	1,9	**2,8**
	Flush toilet connected to a septic tank	Number	9	14	30	13	15	4	**86**
		%	1,0	1,4	6,9	3,0	1,5	2,7	**2,2**
	Chemical toilet	Number	0	12	1	1	1	3	**18**
		%	0,0	1,2	0,2	0,2	0,1	2,1	**0,5**
	Pit latrine with Ventilation pipe	Number	290	486	143	94	273	32	**1 317**
		%	34,5	49,1	32,6	21,2	25,8	22,4	**33,7**
	Pit latrine without ventilation pipe	Number	302	354	233	273	612	94	**1 867**
		%	35,9	35,8	53,1	61,9	57,8	65,0	**47,7**
	Bucket toilet	Number	1	0	0	1	0	1	**2**
		%	0,1	0,0	0,0	0,1	0,0	0,6	**0,1**
	None	Number	236	100	15	40	108	8	**507**
		%	28,0	10,1	3,5	9,0	10,3	5,3	**13,0**
	Other	Number	1	1	1	0	2	0	**5**
		%	0,1	0,1	0,2	0,0	0,2	0,0	**0,1**
Toilet facilities of RDP standard or higher	Yes	Number	441	735	416	411	989	154	**3 146**
		%	51,0	71,1	92,0	90,1	90,9	99,4	**77,7**

* Numbers below 10 000 are too small to provide reliable estimates

Figure 21: Percentage of households living in tribal areas with access to safe water, 2010



Households in Eastern Cape (51,0%) and KwaZulu-Natal (71,1%) had the lowest access to safe water, whilst the situation in the other tribal areas is more comparable with that in the country as a whole. Figure 22 summarises the number of water quality problems experienced by households living on tribal lands. Once again Eastern Cape (43,5%) and KwaZulu-Natal (26,7%) were more likely than the other provinces to have problems with water quality, with a significant percentage of households having one or more quality related problems.

Figure 22: Percentage of households living in tribal areas, having respectively 0,1,2,3 and 4 problems with water quality, 2010

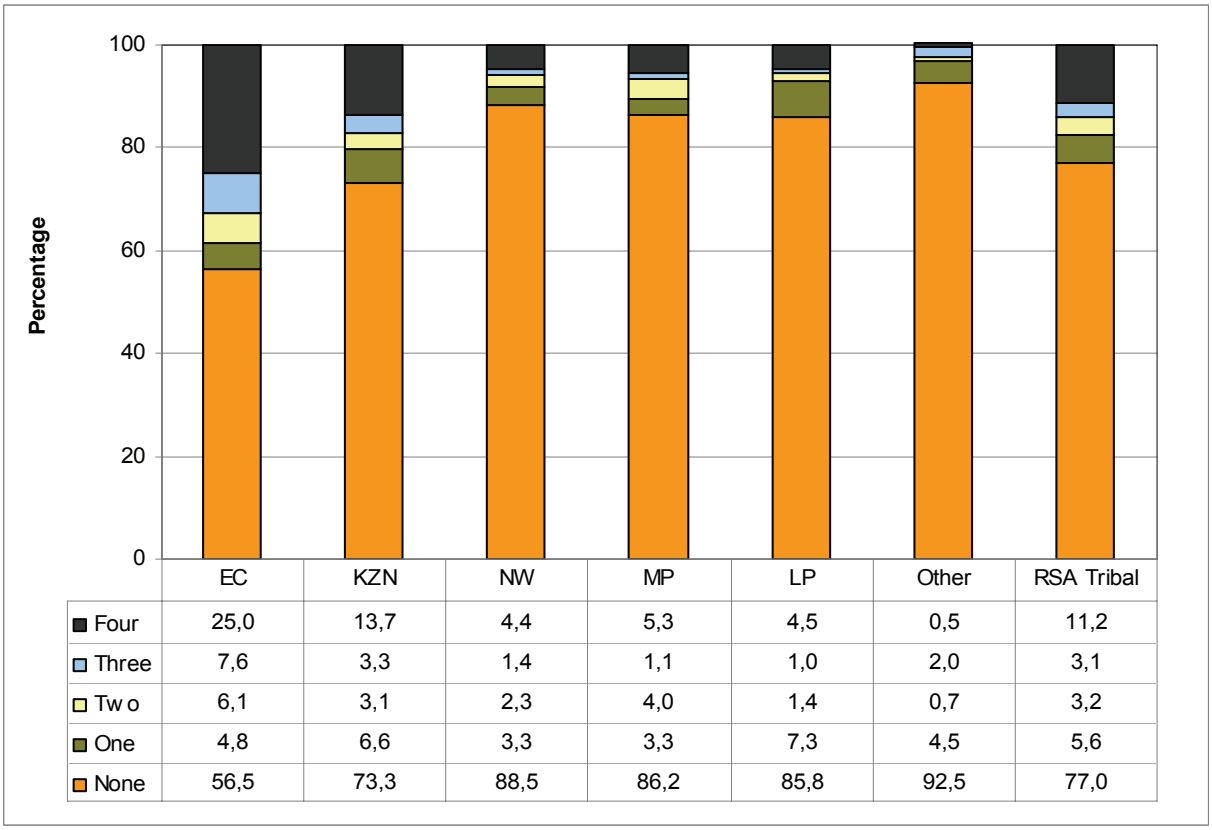
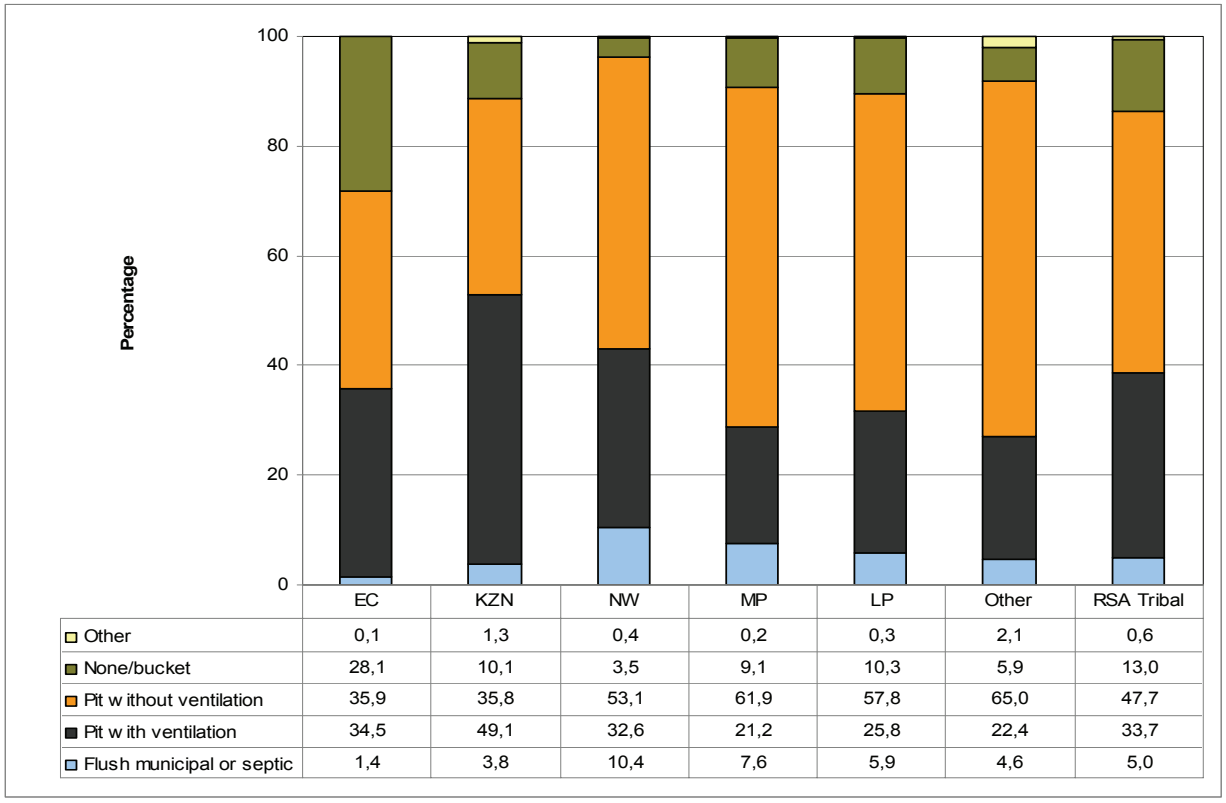


Figure 23: Percentage of households living in tribal land areas using different types of toilet facilities, 2010



	EC	KZN	NW	MP	LP	Other	RSA Tribal
Other	0,1	1,3	0,4	0,2	0,3	2,1	0,6
None/bucket	28,1	10,1	3,5	9,1	10,3	5,9	13,0
Pit without ventilation	35,9	35,8	53,1	61,9	57,8	65,0	47,7
Pit with ventilation	34,5	49,1	32,6	21,2	25,8	22,4	33,7
Flush municipal or septic	1,4	3,8	10,4	7,6	5,9	4,6	5,0

Figure 23 shows that households in North West (10,4%) and Mpumalanga (7,6%) were significantly more likely than households in the other tribal land areas to be using a flush toilet connected to a sewerage system or a septic tank. However, pit latrines remain the main form of waste disposal in all tribal land areas, with pit latrines without ventilation pipes dominating in all provinces except KwaZulu-Natal, where nearly 49% of households use pit latrines with ventilation pipes. The use of pit latrines without ventilation pipes was the most prevalent in Mpumalanga (61,9%), Limpopo (57,8%) and North West (53,1%).

5.2.3 Water supply and sanitation of households spending R1 800 or less per month

In 2001 the generally accepted poverty line for South African households was R800 per month. If that figure is adjusted for inflation on a year on year basis in August, the 2010 poverty line will be R1 370. The GHS questionnaires do not ask for household income, but directly measures earnings from employment and also ask households to categorise their monthly expenditure. Since expenditure for the poor usually is a good reflection of their total income, this measure was selected to reflect socio-economic status. Unfortunately none of the expenditure categories can be used directly for this measure as it falls within the R1 200 to R1 799 expenditure bracket. It was therefore decided for the purposes of this study to make use of the cut-off point of household expenditure of less than R1 800 to represent poor households and households vulnerable to poverty. This section will summarise key water and sanitation indicators of this sub-group.

Table 30: Water and sanitation indicators for households spending less than R1 800 per month

Variable	Category	Statis-tics	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Number of households		Number	576	1 267	207	545	1 841	628	1 670	695	1 132	**8 561**
		%	6,7	14,8	2,4	6,4	21,5	7,3	19,5	8,1	13,2	**100,0**
Access to safe water	Yes	Number	568	889	200	538	1 550	596	1 630	620	1 036	**7 626**
		%	98,5	70,2	96,7	98,6	84,2	95,0	97,6	89,2	91,6	**89,1**
Access to RDP water	Yes	Number	530	722	192	519	1 278	503	1 555	558	800	**6 657**
		%	92,1	57,0	92,9	95,1	69,4	80,1	93,1	80,4	70,7	**77,8**
Traditional dwelling	Safe water	Number	2	246	11	20	317	9	0	34	65	**1 239**
		%	100,0	45,9	94,3	86,5	63,1	100,0	0,0	71,6	91,9	**56,5**
	Unsafe water sources	Number	0	18	0	3	21	0	0	7	0	**64**
		%	0,0	3,4	2,7	13,5	4,1	0,0	0,0	14,0	0,4	**2,9**
	Other sources	Number	0	272	0	0	165	0	0	7	6	**891**
		%	0,0	50,8	3,0	0,0	32,8	0,0	0,0	14,4	7,8	**40,6**
Other dwellings	Safe water	Number	559	639	188	513	1 227	586	1 617	585	970	**5 631**
		%	99,0	88,4	97,0	99,2	92,9	96,3	97,7	91,3	94,2	**89,1**
	Unsafe water sources	Number	4	22	3	4	18	17	34	28	9	**178**
		%	0,8	3,0	1,4	0,8	1,4	2,8	2,1	4,3	0,9	**2,8**
	Other sources	Number	1	62	3	0	75	5	3	28	50	**509**
		%	0,2	8,6	1,6	0,0	5,7	0,9	0,2	4,3	4,9	**8,1**
-Distance to water	Less than 200m	Number	65	327	57	37	378	149	205	146	331	**1 695**
		%	11,5	26,8	27,8	6,9	21,1	24,5	12,7	21,6	31,0	**20,5**
	201–500 metres	Number	23	218	5	12	285	68	26	63	163	**863**
		%	4,1	17,9	2,5	2,2	15,9	11,1	1,6	9,4	15,2	**10,4**
	501m –1 km	Number	2	134	1	1	105	15	8	11	55	**331**
		%	0,4	11,0	0,5	0,2	5,9	2,4	0,5	1,6	5,1	**4,0**
	More than 1 km	Number	0	85	0	0	59	3	1	2	16	**165**
		%	0,0	6,9	0,0	0,0	3,3	0,4	0,0	0,3	1,5	**2,0**
	Water access in dwelling or yard	Number	472	457	142	487	965	374	1 373	452	504	**5 227**
		%	84,0	37,4	69,2	90,7	53,9	61,5	85,1	67,1	47,2	**63,1**
Water quality	Safe to drink	Number	570	969	179	511	1 596	594	1 652	607	1 056	**7 733**
		%	98,9	76,7	86,1	93,7	86,8	94,7	99,2	87,5	93,5	**90,5**
	Clear/free of mud	Number	567	964	174	499	1 638	587	1 648	594	1 062	**7 733**
		%	98,6	76,3	83,9	91,6	89,1	93,6	99,0	85,6	94,1	**90,5**
	Good in taste	Number	567	938	174	506	1 650	575	1 650	596	1 003	**7 659**
		%	98,7	74,3	83,9	92,8	89,7	91,7	99,3	85,9	88,9	**89,7**
	Free from bad smells	Number	560	1 029	180	508	1 656	592	1 626	617	1 064	**7 831**
		%	97,6	81,4	86,6	93,1	90,1	94,5	97,8	88,9	94,4	**91,7**

* Numbers below 10 000 are too small to provide reliable estimates

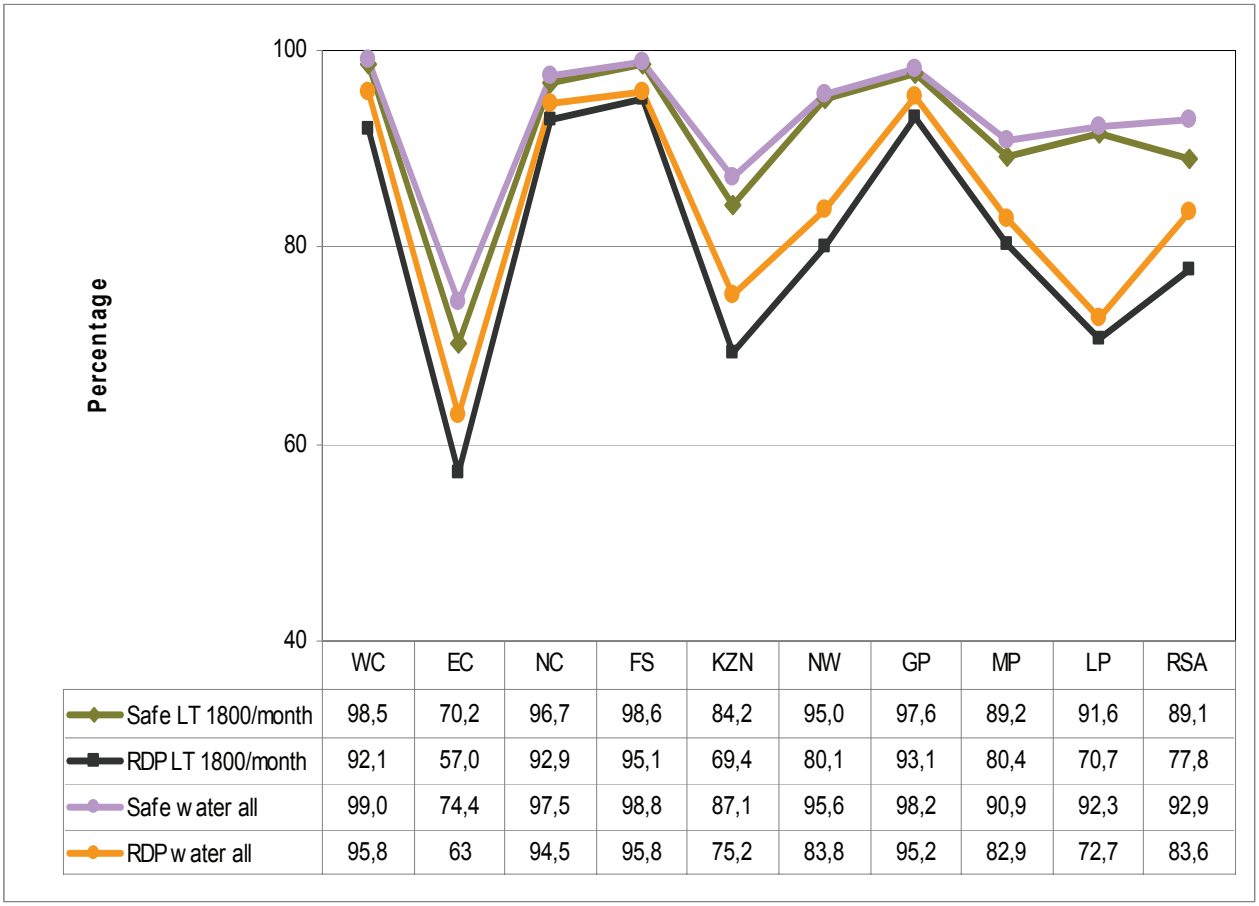
Table 30: Water and sanitation indicators for households spending less than R1800 per month (concluded)

Variable	Category	Statis-tics	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Pay for water	Yes	Number	221	213	85	151	449	151	535	123	112	**2 040**
		%	43,7	25,5	51,3	31,4	31,5	35,2	33,6	21,5	13,5	**29,8**
Number of quality problems	0 problems	Number	557	893	168	491	1 551	561	1 624	575	979	**7 399**
		%	96,7	70,5	81,1	90,1	84,2	89,3	97,3	82,8	86,5	**86,4**
	1 problem	Number	13	49	7	8	75	22	28	16	82	**299**
		%	2,3	3,9	3,3	1,5	4,1	3,5	1,7	2,3	7,2	**3,5**
	2 problems	Number	0	66	4	12	40	17	6	26	13	**185**
		%	0,0	5,2	2,0	2,3	2,2	2,7	0,4	3,8	1,1	**2,2**
	3 problems	Number	1	62	5	9	40	8	9	18	13	**166**
		%	0,2	4,9	2,4	1,7	2,2	1,2	0,6	2,6	1,1	**1,9**
	4 problems	Number	5	197	23	24	135	20	3	60	45	**512**
		%	0,8	15,5	11,3	4,4	7,3	3,3	0,2	8,6	4,0	**6,0**
Treat water	Yes, always	Number	6	26	14	15	39	15	76	47	23	**260**
		%	1,0	2,1	6,7	2,7	2,1	2,3	4,6	6,8	2,0	**3,0**
	Yes, sometimes	Number	11	76	21	37	109	27	32	66	40	**420**
		%	1,9	6,1	10,4	6,8	6,0	4,3	1,9	9,6	3,6	**4,9**
	No, never	Number	558	1160	171	494	1 684	585	1 553	580	1 064	**7 848**
		%	97,1	91,9	82,8	90,5	91,9	93,4	93,6	83,7	94,4	**92,0**
Type of toilet facilities	Flush toilet connected to public SS	Number	454	355	121	323	543	193	1 277	175	139	**3 579**
		%	81,8	28,7	61,0	66,7	30,8	31,4	79,9	26,1	12,6	**43,5**
	Flush toilet connected to a septic tank	Number	49	29	7	5	56	31	15	21	13	**227**
		%	8,9	2,4	3,6	1,1	3,2	5,0	0,9	3,1	1,2	**2,8**
	Chemical Toilet	Number	6	1	3	3	18	1	19	1	2	**53**
		%	1,0	0,1	1,7	0,7	1,0	0,2	1,2	0,1	0,1	**0,6**
	Pit Latrine with Ventilation pipe	Number	5	286	22	38	557	132	60	102	248	**1 451**
		%	0,9	23,2	11,3	7,8	31,6	21,6	3,8	15,2	22,4	**17,6**
	Pit Latrine without Ventilation pipe	Number	1	300	24	76	443	221	186	311	586	**2 148**
		%	0,2	24,3	12,0	15,8	25,1	36,1	11,6	46,4	53,0	**26,1**
	Bucket Toilet	Number	22	14	3	24	8	0	15	2	0	**88**
		%	3,9	1,1	1,6	5,0	0,4	0,0	0,9	0,2	0,0	**1,1**
	None	Number	16	247	17	12	141	34	18	60	116	**661**
		%	2,9	20,0	8,4	2,5	8,0	5,6	1,1	8,9	10,5	**8,0**
	Other	Number	2	3	1	2	1	1	8	0	2	**20**
		%	0,3	0,2	0,3	0,3	0,1	0,2	0,5	0,0	0,2	**0,2**
Toilet facilities of RDP standard or higher	Yes	Number	509	670	151	366	1156	355	1353	297	400	**5257**
		%	91,7	54,3	75,9	75,7	65,5	58,0	84,6	44,4	36,2	**63,9**

* Numbers below 10 000 are too small to provide reliable estimates

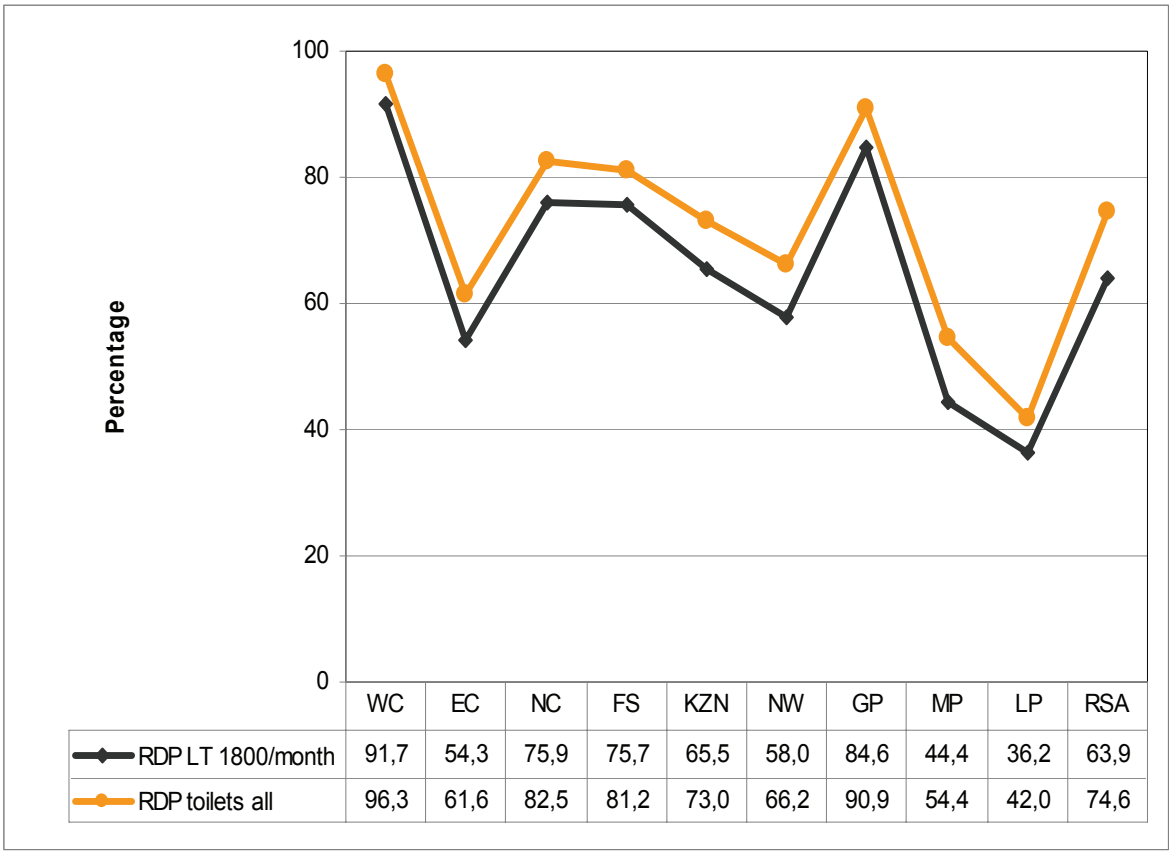
Table 30 indicates that 89,1% of low income households (spending R1 800 or less per month) have access to safe water and 77,8% have access to water of RDP standard or higher. This is lower than for the population in general (Figure 24). In 2010, low income households in the Eastern Cape (57,0%), KwaZulu-Natal (69,4%) and Limpopo (70,7%) are significantly less likely to have access to water of RDP standard than households in general. Only 29,8% of low income households who use water from municipal sources pay for their water which is signficiantly lower than the popaution in general. Approximately 14% of low income households had at least one water quality problem compared to 6,3% in the population in general.

Figure 24: Percentage of households who spend less than R1 800 per month that have access to safe water and RDP water respectively, compared with the population in general, 2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Safe LT 1800/month	98,5	70,2	96,7	98,6	84,2	95,0	97,6	89,2	91,6	89,1
RDP LT 1800/month	92,1	57,0	92,9	95,1	69,4	80,1	93,1	80,4	70,7	77,8
Safe w ater all	99,0	74,4	97,5	98,8	87,1	95,6	98,2	90,9	92,3	92,9
RDP w ater all	95,8	63	94,5	95,8	75,2	83,8	95,2	82,9	72,7	83,6

Figure 25: Percentage of households who spend less than R1 800 per month that have access to toilet facilities of RDP standard or higher, compared with the population in general, 2010



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
RDP LT 1800/month	91,7	54,3	75,9	75,7	65,5	58,0	84,6	44,4	36,2	63,9
RDP toilets all	96,3	61,6	82,5	81,2	73,0	66,2	90,9	54,4	42,0	74,6

An estimated 10% fewer low income households than households in general have access to sanitation facilities of RDP standard. These differences are most pronounces in Mpumalanga, North West, KwaZulu-Natal and the Eastern Cape.

6. Discussion and conclusions

Water services

Even though the GHS neither measures the quantity of water that households have access to nor employ scientific measures to test potability, the study does provide some insight into the nature of water sources, user perceptions related to quality as well as water service provision. In 2010, 41,5% of South African households had tap water within their dwelling and a further 29,1% piped or tap water in their yards. Between 2002 and 2010 the percentage of households with piped or tap water in their dwellings or yards increased from 68,2% to 70,6%. During the same reference period there has been a significant decrease in the percentage of households who draw water from natural water sources, such as streams, rivers, dams, wells, and springs. The use of flowing water, streams, and rivers as a main source of drinking water decreased from roughly 9,9% in 2002 to 5,6% in 2010. There was also a reported decline in the use of wells and springs.

When categorising water sources used for drinking into safe (piped/tap/borehole on and off-site) and unsafe sources (natural sources such as rivers, wells, springs, dams etc.) it was found that the percentage of households in South Africa that have access to safe water increased from 88,7% in 2002 to 92,9% in 2010. This compares favourably with countries such as Brazil where 80% of households were connected to water supply networks and per implication accessed safe water in 2003 (UNDP 2006) and Egypt, where 99% of the urban population and 96% of the rural population had access to tap water in 2002 albeit with huge disparities between regions (MDG report 2004). It is significantly better than Kenya where 89% of the population in urban areas and 49% of the rural population have access to safe water (MDG report 2005)[45]. All these countries note significant variation between regions in terms of access to safe water as well as sanitation. The GHS data suggests that living on tribal land and or traditional dwellings significantly reduces a household's chances to access safe water sources. Only 58,3% of South African households living in traditional dwellings and only 77,7% of those living on tribal land have access to safe water sources. The tribal areas most affected by poor access to safe water were Eastern Cape (51,0%) and KwaZulu-Natal (71,1%) and that is no doubt also the reason why these two provinces had the lowest access to safe water in general at 74,4% and 87,1% respectively. Having said that there has been a significant improvement in both these provinces as well as in Limpopo in terms of access to safe water between 2002 and 2010 where access to safe water in Eastern Cape increased from 58,7% in 2002 to 74,4% in 2010 and in KwaZulu-Natal from 82,8% to 87,1% in 2010. Even though access to safe water in Limpopo is relatively high at present (92,3%) it did improve significantly from the 84,5% level recorded for 2002. During this same period there has been a decline in access to safe water in North West (from 97,0% to 95,6%) and in Mpumalanga (from 94,8% to 90,9%). This corresponds with relatively high rates of interruptions and poor levels of satisfaction with water services. Reported problems with water quality in these two provinces and the decline in access most probably relate to poor maintenance of water supply infrastructure in these provinces. When modelling for factors predicting access to safe water, it was found that South African households who own their dwellings and with good access to basic services (sanitation, refuse removal, connection to the mains) are more likely to have access to safe water. Access to safe water is negatively associated with problems related to water quality, poor municipal services, monthly household

[45] Definitional differences may not make these country statistics strictly comparable, but it nevertheless give an indication of comparative levels of access in a broader sense.

expenditure of R1 800 or less and receipt of social grants. These findings confirm that living in an area where most households are poor, have poor access to other basic services such as refuse removal and sanitation and where general municipal services are poor are the most likely to not have access to safe water.

South African households are increasingly less likely to travel distances of 201m or more to get drinking water. Between 2002 and 2010 the percentage of households who travel more than 200m decreased in North West (from 12,4% to 10,7%), Mpumalanga (from 15,8% to 9,9%), Free State (from 2,9% to 2,1%) and Gauteng (from 2,4% to 1,2%).

The responsibility of water supply provision has been devolved to municipalities both in terms of basic services provision, maintenance and revenue collection. The GHS data suggest that payment for municipal water services has decreased nationally from 62,0% in 2002 to 47,1% in 2010. This may be associated with a general decline in economic conditions following the 2008 economic slump as well as an increase in support to indigent households as evidenced from the reasons given for non-payment. Provinces most affected by the decreases in payment rates are: Free State and North West (18% decrease), Gauteng (16% decrease) and Western Cape, Eastern Cape, KwaZulu-Natal and Limpopo (15% decrease). The provinces with the lowest payment rates for municipal water in 2010 were: Limpopo (20,8%), Mpumalanga (31,9%), Eastern Cape (38,7%) and Free State (44,2%).

Non-payment in Gauteng and Western Cape can primarily be attributed to indirect payments made through level or as part of rental agreements, whilst in the other provinces indigence or 'permission from the municipality not to pay' play a central role. Northern Cape (36,4%) and Limpopo (32,4%) had the most significant proportion of households falling into this category. A lack of water meters or faulty water meters was given as a reason for not paying by roughly 30,3% of households in Limpopo, 25,3% of households in Mpumalanga, and 17,5% in the Free State. These problems are clearly related to the quality of water services management and need to be corrected. In spite of this, logistic regression modelling suggests that the most prevalent underlying predictor of non-payment is poverty and poor access to basic services. The removal of refuse at least once a week or more often is a good indicator of municipal service delivery in general as it is usually the first to be neglected if there are management problems. The absence of a regular refuse removal service and water supply interruptions are additional predictors of non-payment across most provinces. Thus even though poverty and inability to pay plays a major role there is some indication that improvement in the quality of water service delivery may help to reduce payment default rates.

Payment rates for municipal services declined from 76,3% in 2005 to 58,0% in 2009 which was its lowest point thus far. During 2010 the situation improved slightly to 63,6%. The latter change may relate to service delivery protests that took place during 2009 and the government's renewed commitment to improving service delivery as part of the current MTSF. Approximately 9% of households in South Africa rated the water services that they receive as poor in 2010.

The decrease in satisfaction with water services is mirrored by increases in the percentage of households with water quality problems and increases in the interruption of water supply services. Nationally there was a decrease in water interruptions due to the authorities maintaining water infrastructure from 49,6% in 2009 to 47,6% in 2010. Mpumalanga (80,0%), Limpopo (69,8%) and Eastern Cape (63,4%) had the highest proportion of households who suffered from interruptions during the year preceding the survey. Significant reductions of the proportion of

households who experienced interruptions occurred in the Western Cape (22,9% in 2009 and 20,3 in 2010) and KwaZulu-Natal (70,6% in 2009 to 47,1% in 2010).

The DWA and municipalities aim to resolve interruptions within 48 hours or two days. Nationally approximately half of the interruptions lasted for two consecutive days or longer. Households in Limpopo (81,2%), Mpumalanga (74,8%), North West (57,8%), Eastern Cape (56,3%) and KwaZulu-Natal (54,8%) were significantly more likely than households in other provinces to wait for more than two consecutive days for their water interruptions to be resolved. Most of the households who had cases with a combined total of interruptions for 15 days or more in 2010 were from Mpumalanga (22,5%), Limpopo (21,0%) and KwaZulu-Natal (16,6%). Province percentages showing the highest levels of problems that lasted 15 days or longer were in Mpumalanga (68,0%), Limpopo (60,7%) and the Eastern Cape (40,5%). Regression models suggest that good predictors of interruptions are large household sizes, low household incomes and grant receipt, and poor municipal services ratings. Once more low–income households appear to have poorer water services in terms of the nature of water interruptions than those living elsewhere.

Nationally 6,3% of households had one or more problem related to municipal water quality. The only provinces where significantly higher percentages of households had at least one problem with municipal water quality were: Mpumalanga (17,6%), North West (9,3%), Free State (9,2%) and Limpopo (8,1%). Once again water quality problems appear to be more significant in tribal areas. Households living on tribal land in the Eastern Cape (43,5%) and KwaZulu-Natal (26,7%) were significantly more likely than the other provinces to have at least one water quality related problem than households living in other provinces and the population in general.

Perceptions about the quality and safety of water seems to indicate a declining confidence in water quality and yet the percentage of households who treat their water by boiling, adding chlorine or chemicals before use has been declining steadily over time. Nationally 13,5% of households treated their water in 2006, whilst only 7,9% treated it in 2010. Highest treatment rates have been reported in Mpumalanga (16,7%) where there also is the highest percentage of households experiencing water quality problems.

Sanitation

A basic sanitation facility is defined by the DWA as safe, reliable, private, and protected from the harsh weather conditions and ventilated, easy to keep clean and keeps smells to the minimum, is easy to keep clean. It should also reduce the risk of the spread of sanitation-related diseases by facilitating the appropriate control of disease-carrying flies and pests. Clearly flush toilet toilets connected to a public and or septic tank system meet these requirements. However, in many rural areas of South Africa there are no water–borne sewerage systems and the costs of septic tank systems are also quite high. In those instances most households use pit latrines. A simple, but effective modification that reduces smells, flies and spread of sanitation–related diseases is the ventilated pit latrine. Thus the DWA defines sanitation at an RDP level or higher as including not only flush toilets but also pit latrines with ventilation pipes.

More than half (58,7%) of South African households use flush toilets connected to a public sewerage system. This is followed by pit latrines without ventilation pipes (18,8%) and pit latrines with ventilation pipes (12,5%). Provinces with the highest access to flush toilets were Western Cape (90,4%), Gauteng (87,2%), Free State (73,8%)

and Northern Cape (68,7%). Access to flush toilets connected to a public sewerage system in the dwelling has increased significantly over the reference period from 55,6% in 2002 to 58,7% in 2010. In addition to these changes over time, there is also some evidence to suggest change is taking place at the lower end of the sanitation facility spectrum. Using no toilet facilities (10,0% in 2002 to 5,3% in 2010) and pit latrines (25,2% in 2002 to 18,8% in 2010) are gradually making way for improved pit latrines (4,4% in 2002 to 12,5% in 2010) in many areas. However, progress is still slow. With the exception of KwaZulu-Natal, none of the other provinces with significant pit latrine use are successfully transitioning to improved pit latrines. KwaZulu-Natal is the only province where a greater proportion of households use pit latrines with a ventilation pipe than without a ventilation pipe (25,5% and 20,1% respectively). Even though the use of improved pit latrines has increased in Limpopo, Mpumalanga and North West currently more than double the percentage in Limpopo (21,0% v. 48,8%) and Mpumalanga (13,2% v. 38,7%) use pit latrines without ventilation pipes than those with ventilation pipes. Once again tribal areas are well behind the population in general. Pit latrines remain the main form of waste disposal in all tribal land areas (80,4%), with pit latrines without ventilation pipes (47,7%) outnumbering those with (33,7%). This pattern was found in all provinces except KwaZulu-Natal where nearly 49% of households use pit latrines with ventilation pipes compared to 35,8% without. The use of pit latrines without ventilation pipes was the most prevalent in Mpumalanga (61,9%), Limpopo (57,8%) and North West (53,1%).

Even though there is a lot of room for improvement in upgrading pit latrines to ventilated, improved pit latrines, there has been a substantial increase across most provinces in the degree of access to sanitation facilities at RDP standard or higher across most provinces between 2002 and 2010. The most significant improvements have taken place in Eastern Cape (27,5% point increase), KwaZulu-Natal (21,1% point increase), Limpopo (14,7% point increase), North West (11,5% point increase). In Eastern Cape only 34,1% had access to a sanitation facility of RDP standard or higher in 2002. This increased to 61,6% in 2010. In Limpopo the increase was from 27,3% to 42,0% and in KwaZulu-Natal from 51,9% to 73,0%. Considering the encouraging trends in KwaZulu-Natal and their large-scale transformation from pit latrines to pit latrines with ventilation, other provinces should consider looking at their approach to further increase improvements in the field of sanitation.

Comparison with other countries is difficult in the case of sanitation, once again because standards differ. For example in Kenya access to safe sanitation in urban areas is estimated at 94,8% and 76.6% in the rural areas (MDG report 2005). However, in their case, normal pit latrines without ventilation are also considered safe. In Brazil (UNDP 2006) between 18% and 52% of the population are connected to public sanitation systems.

7. Summary

The General Household Survey has been measuring key indicators related to water and sanitation in South Africa since 2002. This study provides a more in-depth analysis of the historical data series and is aimed at providing planners and strategist some insight into the current situation, as well as the changes that took place in the water and sanitation sector over this time period.

The data shows significant improvements in terms of increased access of South African households to basic sanitation and safer water closer to the dwelling. Between 2002 and 2010 the percentage of households with piped or tap water in their dwellings or yards increased from 68,2% to 70,6%. During the same period the percentage of households sourcing water from natural water sources, such as streams, rivers, dams, wells, and springs also decreased significantly (from 9,9% in 2002 to 5,6% in 2010). When considering safe water sources (piped/tap/borehole) regardless of distance 92,9% of households had access to safe water in 2010, compared with 88,7% in 2002. Thus in terms of access to safer water, service provision did not only keep up with population growth, but exceeded it. Progress in terms of access to water within the RDP standard of piped/tap/borehole water being closer than 200 metres from the dwelling, change has also been significant albeit with a levelling off after 2007. In 2002, 69,6% of South African households had access to water at RDP standard. This grew steadily to 85,1% in 2007. Between 2008 and 2010 this figure levelled off to a relatively stable 83% in spite of continued investment in water infrastructure. It appears as if most resources during that time went towards further improving access for those who already met the RDP targets, instead of expanding to households who are using unsafe water sources or who travel long distances to access drinking water.

Water supply interruptions have inreased between 2009 and 2010. If interruptions lasting for two consecutive days or longer, as well as where a total number of 15 days of interruption per annum are considered as unstable supply, 76,3% of households in South Africa had access to a stable municipal water supply in 2009 and 74,5% in 2010. South African households are also increasingly unhappy about the quality of the water supply services they receive. In 2005, 7,9% throught the services are poor this gradually increased and peaked at 10,2% in 2009 and then setlling at 9,4%. During this same time period there has been a sharp decline in household who rated the services as ‘good‘(from 76,3% in 2002 to 63,6% in 2010). Water quality as rated with a questionnaire survey is always subjective. In 2010 only 6% of users of municipal water felt that either the safety/clarity/smell or taste of their water was unacceptable. For users of non-municipal water, as many of 44% of households had problems with the water quality indicators measured in the GHS.

Only 58,3% of South African households living in traditional dwellings and only 77,7% of those living on tribal land have access to safe water sources. The tribal areas most affected by poor access to safe water were the Eastern Cape (51,0% with acces) and KwaZulu-Natal (71,1% with access).

Even though households increasingly have access to safer water closer to their homes payment for water services decreased significantly since 2008 (from 67,2% to 47,1% with a starting point iof 62,0% in 2005 when this question was asked for the first time). These problems are clearly related to the quality of water services management and need to be corrected. Logistic regression modelling suggest that poverty, poor access to basic services and poor municipal service delivery are the main contributors towards decreased payment rates.

On the sanitation front significant progress has also been made. More than half (58,7%) of South African households use flush toilets connected to a public sewerage system. This is followed by pit latrines without ventilation pipes (18,8%) and pit latrines with ventilation pipes (12,5%). Provinces with the highest access to flush toilets were Western Cape (90,4%), Gauteng (87,2%), Free State (73,8%) and Northern Cape (68,7%). Using no toilet facilities (10,0% in 2002 to 5,3% in 2010) and pit latrines without ventilation pipes (25,2% in 2002 to 18,8% in 2010) are gradually making way for improved pit latrines (4,4% in 2002 to 12,5% in 2010) in many areas. However, progress is still slow as the relatively simple and inexpensive installation of ventilation pipes for pit latrines is still low. This small modification increases protection against vector born diseases, reduce smells and generally improves the quality of sanitation. The use of pit latrines without ventilation pipes is still very prevalent in Mpumalanga (38,7%), Limpopo (48,8%) and North West (29,2%). KwaZulu-Natal is the only province where more households use pit latrines with ventilation pipes (25,5%) than those without (29,2%). Given that KwaZulu-Natal has been able to make this significant shift, there clearly is an opportunity here to also improve access to sanitation facilities of RDP standard and higher in Limpopo, Mpumalanga and North West.

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8. Limitations of the study

Household sample surveys have the advantage that they obtain information directly from the source and as such can reveal inaccuracies in administrative data systems. In terms of water and sanitation statistics the following limitations of the study needs to be highlighted:

- Phenomena that tend to cluster geographically tend to be less adequately reflected in inferential statistics.
- The General Household Survey uses proxy respondents, as the heads of households and their partners are not always available during the interviews. The use of proxy respondents sometimes compromises the quality of the information obtained especially when details such as reasons for non-payment etc. are requested.

9. Variable categorisation

The table below summarises the way variables were analysed for the purposes of the logistic regression models.

Variable name	Description of variable	Variable values
Head_age2	Age of household head	Value=1 if head_age less than 35 Value=2 if head_age greater or equal 35
hsex	Sex of household head	Value=1 if head_sex=2 Value=0 if head_sex=1
type	Type of main dwelling	Value=0 if q31maind in (2, 8, 9,11,12) Value=1 if q31maind in (1,3,4,5,6,7,10) Value=' ' if q31maind equals 99
safwat	Main source of drinking water	Value=1 if q313drin in (1,2,3,5,6,8) Value=2 if q313drin in (4,7,9,10,11,12) Value=' ' if q313drin in (13,99)
rooms	Number of rooms household occupies	Value=0 Value=1 if q35totrm in (1,2,3,4) Value=' ' if q35totrm equals 99
owner	The tenure status of the dwelling	Value=1 if q36owner in (2,3,4) Value=2 if q36owner in (1,5) Value=' ' if q36owner greater than 6
grant	Social grant	Value=1 if soc_grant is greater or equal to 1
hholdsize	Household size	Value of 0 if greater than 3,5 Value of 1 if less than 3,5
watqual	Water quality before treatment	Value=0 Value=1 if q315saf=2 or q315cle=2 or q315tas=2 or q315odo=2
munrate	Municipal water ratings	Value=0 if q318rate not equal to 3 Value=1 if q318rate equals 3 Value: ' ' if q318rate equals 9
Toil	Type of toilet facility	Value: 0 if q324toil not in (1,2,3,4,5,9) Value: 1 if q324toil in (1,2,3,4,5,9)
amains	Connection to MAINS electricity supply	Value: 1=Yes; 2=No Value:' ' if q330amains greater than 2
rubb	Rubbish disposal system	Value: 0 if q335rubb not in (1,3,5) Value: 1 if q335rubb in (1,3,5) Value: ' ' if q335rubb equals 99
exp	Household expenditure	Value: 0 if q417exp 7 or more Value: 1 if q417exp less than 7 Value: ' ' if q417exp greater or equal to 11
inc	Total household income	Value: 0 Value: ' ' if totmhinc=9999999 Value: 1 if totmhinc less or equal to 1800
muni	Municipal water supply	Value: ' ' if q317muni equals 9 Value: 1=Yes and 2=No
payw	Paying for municipal water supply	Value: ' ' if q319apayw equals 9 Value: 1=Yes and 2=No
Inter	Municipal water interruption	Value: ' ' if q321ainte equals 9 Value: 1=Yes and 2=No

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