



Foundation

World Risk Poll 2024 Report

A World of Waste:
Risks and opportunities
in household waste
management

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Foreword



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As the global population continues to expand and development accelerates, the volume of waste generated worldwide is increasing at an unprecedented rate. Safely managing this growing waste burden is an escalating challenge with significant implications not only for the environment but also for human health, safety, and wellbeing – particularly for informal waste workers, who are often the most vulnerable.

The Lloyd's Register Foundation World Risk Poll, conducted every two years, provides a crucial platform for people around the world to voice their concerns, systematically gathering data on everyday risks and harms. By amplifying the voices of those who are often marginalized or underrepresented, the Poll offers invaluable insights that can and should be used to guide interventions aimed at protecting the most vulnerable global populations.

The Foundation's mission to engineer a safer world underpins our commitment to safer waste management. Back in 2017, our *Insight Report on Global Safety Challenges* identified safe disposal as a recurring, cross-cutting theme. This led to the *Global Review on Safer End of Engineered Life*, a collaboration with Engineering X that underscored the risks presented by widespread practices such as uncontrolled burning and waste dumping, and the need for more data on these issues.

Our ongoing partnership with Engineering X, which has spanned five years and led to the emergence of new regional roadmaps to stop open burning, is a vital component of our broader efforts. However, our ambitions extend beyond addressing open burning alone. We are advocating for the global recognition of waste management as essential infrastructure, emphasising the fundamental right of every individual to safe and effective waste disposal.

We hope this report, along with the data it presents, will act as a catalyst for meaningful change. By identifying communities that lack access to safe, controlled disposal methods, we aim to support efforts to improve equity in waste management, ensuring that all populations have the opportunity to live in a safer and healthier environment.

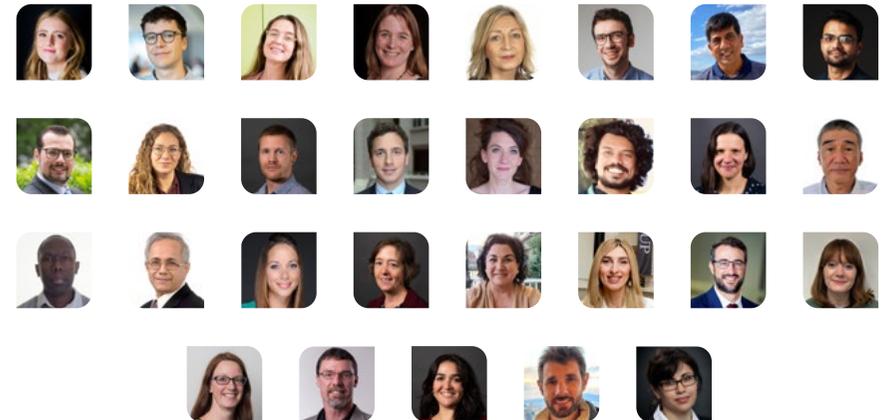
Acknowledgements

The World Risk Poll is a huge undertaking powered by multidisciplinary teams working across organisations. Lloyd's Register Foundation is grateful to everyone who has contributed to this, and previous versions of the World Risk Poll, and the collaborative spirit in which they work.

We are continually inspired by the enthusiasm of our strategic impact partners who have invested time in developing the questionnaire and are now embedding the data in their work, inspiring and galvanising people to take action. You can follow their journeys, and the change created, through the Poll website at wrp.lrfoundation.org.uk.

The Technical Advisory Group for the World Risk Poll was first convened in early 2019, and we are indebted to the ongoing time and effort voluntarily invested by the members in the analysis, planning and reviewing of all our outputs.

Finally, our thanks are extended to the team at Gallup for their efforts in constructing and testing the Poll, and to the local staff in countries across the globe who undertook the fieldwork, often under difficult circumstances. We are particularly grateful to the World Risk Poll delivery and analytical team at Gallup for their ongoing contributions and support.



Executive summary

The World Risk Poll is the first and only global, nationally representative study of worry about, and harm from, risks to people's safety. The Poll is based on nearly 147,000 interviews conducted by Gallup in 142 countries and territories throughout 2023 and covers places where little to no official data on safety and risks exist. This module of the Poll provides the first ever globally comparable measurement of people's household waste practices.

The Poll is a unique resource for defining the nature and scale of safety challenges across the world, including hazards associated with uncontrolled waste disposal. Governments, regulators, businesses, NGOs and international bodies can and should use this freely available data to inform and target policies and interventions that make people safer.

Key findings and policy implications

- At a global level, plastic and food waste are the materials people throw away most. Four in five people (80% — 42% plastic, 38% food) name one of these as the most common material in their household waste.
 - Plastic is the most common material thrown out in high-income countries. However, plastic waste is also highly prevalent in some lower-income countries, and while higher-income countries often have the infrastructure and capacity to manage recyclable waste relatively effectively, lower-income countries often lack such recycling capabilities.
 - **Policy implication:** Beyond emphasising the principles of reducing and re-using materials, recycling infrastructure should be enhanced in countries with high rates of plastic disposal but low rates of organised household waste collection.
- Slightly over half (53%) of people worldwide live in households that separate materials in their household waste before disposing of it, although households in high-income countries are much more likely to separate their waste than those in low-income countries (81% vs. 31%).
 - In high-income countries, people who feel threatened by climate change are more likely to separate their household waste than those who do not.
 - **Policy implication:** Separation of recyclable and non-recyclable waste at the household level is an important first step to enabling high recycling rates and reducing the volume of waste entering landfills. Authorities responsible for waste management should look to capitalise on high separation rates in high-income countries by helping residents separate correctly with clear and consistent guidance, and focus messaging on getting people to separate in the first place in lower- and middle-income countries.
- Government collection is the most common waste disposal method (44% of global households benefit from this approach), but there is a significant divide in collection between urban and rural areas. This divide becomes sharper as country income level declines.
 - In low-income countries, 39% of households in cities have their waste collected government, private company or community organisation, compared to just 2% in rural areas.
 - **Policy implication:** Closing the gap between rural and urban areas requires significant infrastructural investment but will help drive down uncontrolled household waste disposal and, ultimately, result in better outcomes for public and environmental health.
- Four in 10 households worldwide dispose of their waste in an uncontrolled way (i.e., do not have it collected and either burn, dump or take it to landfill), which poses safety risks to public and environmental health. One in seven households around the world (14%) burn their waste, and rates are highest in Central/Western Africa (34% of households) and Eastern Africa (41%).
 - Rates of open burning are high in many countries, including those where the law prohibits it. For example, 48% of households in Indonesia report burning their waste. The fact that nearly half of all households in the country flout the regulation demonstrates that banning the open burning of household waste is often ineffective on its own unless people are provided with viable alternatives.
 - **Policy implication:** The more prevalent household waste collection is, the less household waste is burned. This correlation at least partially supports the hypothesis proposed by many experts, that household collection is a crucial factor in preventing open burning. Developing collection infrastructure that leads to controlled landfills should be an urgent priority for countries where residents currently have little alternative.
- Just a third (33%) of global households separate their waste and have it collected. In contrast, 43% of households either separate their waste or have it collected, but not both.
 - Households in high-income countries are overwhelmingly likely to separate their waste and have it collected (71%). However, in low-income countries, just 4% of households do the same, and the majority (61%) of households neither separate nor have their waste collected.
 - **Policy implication:** The 43% of households that are 'half way there' in terms of safe and sustainable waste disposal represent a significant opportunity for policymakers to complete the loop by designing interventions that make it easier for those people to either separate their waste or have it collected.

Contents

| | |
|---|-----------|
| Foreword | |
| Acknowledgements | |
| Executive summary | |
| 1. Introduction | 1 |
| 2. The material world | 3 |
| <i>What people say their households throw away</i> | 3 |
| <i>What do households in different countries and regions throw away the most?</i> | 4 |
| <i>Who throws what away? Differences by key demographic groups</i> | 7 |
| 3. Dividing lines in waste separation | 10 |
| <i>Waste separation and views on climate change</i> | 15 |
| 4. The open burning of household waste | 16 |
| 5. Controlled disposal: An urban–rural divide | 22 |
| <i>Focus on India: Regional waste disparities</i> | 26 |
| <i>Focus on Brazil: Open burning in river deltas</i> | 29 |
| 6. Global household waste: Further analysis | 32 |
| 7. Conclusion | 35 |
| References | |
| Appendices | |
| Additional information | |

List of figures

| | |
|---|-----------|
| Chart 2.1. Most commonly reported primary material in household waste globally | 3 |
| Chart 2.2. Most common type of material reported in household waste globally, by World Bank country income level | 4 |
| Chart 2.3. Most common categories of material reported in household waste globally, by World Bank country income level | 5 |
| Chart 2.4. Most common categories of material reported in household waste, by region | 6 |
| Table 2.1. Top 10 countries/territories where each waste material is most commonly disposed of | 7 |
| Chart 2.5. Global differences in primary reported form of household waste, by gender | 7 |
| Chart 2.6. Percentage of households globally whose primary reported form of waste is dry recyclables, by age and World Bank country income level | 8 |
| Table 2.2. Countries/Territories with the largest age gaps among people who report primarily disposing of dry recyclables | 8 |
| Chart 2.7. Percentage of households globally whose primary form of waste is dry recyclables, by education and World Bank country income level | 9 |
| Chart 3.1. Percentage of households that separate their waste before disposal, by region | 11 |
| Chart 3.2. Percentage of households globally that separate waste before disposal, by World Bank country income level | 12 |
| Table 3.1. Top 10 countries/territories that do or do not separate their household waste before disposal | 12 |
| Chart 3.3. Percentage of households globally that separate their waste before disposal, by age | 13 |
| Chart 3.4. Top 15 countries with the largest gaps in separating household waste between those aged 15–29 and 65+ | 13 |
| Chart 3.5. Percentage of households globally that separate their waste before disposal, by gender | 14 |
| Chart 3.6. Percentage of households globally that separate their waste before disposal, by climate change concern and World Bank country income level | 15 |
| Chart 4.1. Global household waste disposal methods, controlled and uncontrolled disposal | 17 |
| Chart 4.2. Percentage of households whose primary method of waste disposal is open burning, by region | 18 |
| Chart 4.3. Countries where open burning is the most common form of household waste disposal | 19 |
| Chart 4.4. Relationship between national waste collection rates and open burning, by World Bank country income level | 20 |
| Chart 5.1. Percentage of households that have their waste collected, by region | 22 |
| Chart 5.2. Global household waste collection rates, by degree of urbanisation and World Bank country income level | 23 |
| Chart 5.3. Household waste collection rates, by degree of urbanisation and global region | 24 |
| Chart 5.4. Top 15 countries with the largest gaps between cities and rural areas in organised waste collection | 25 |
| Chart 5.5. Indian household waste collection rates and open burning, by degree of urbanisation | 26 |
| Chart 5.6. Indian household waste collection rates and open burning, where plastic is the main form of waste, by degree of urbanisation | 26 |
| Chart 5.7. Indian household waste open burning, by income quintile and degree of urbanisation | 27 |
| Chart 5.8. Indian household waste open burning, by region | 28 |
| Chart 5.9. Brazilian household waste collection rates and open burning, by degree of urbanisation | 29 |
| Chart 5.10. Brazilian household waste open burning, by income quintile and degree of urbanisation | 29 |
| Chart 5.11. Brazilian household waste open burning, by region | 30 |
| Chart 6.1. Percentage of households per waste behaviour quadrant, by World Bank country income level | 32 |
| Table 6.1. Top 10 countries with the highest percentage of households whose waste is collected but not separated | 33 |
| Table 6.2. Top 10 countries with the highest percentage of households whose waste is separated but not collected | 33 |
| Chart 6.2. Relationship between proportions of household waste mix that is collected, separated and comprised of dry recyclables, by World Bank country income level | 34 |

1. Introduction

Every person on earth lives with waste. Whether in mega-cities or villages, high- or low-income countries, people produce and encounter household waste in some form. Decisions about what we throw away and how that waste is disposed of are closely tied to how we interact with the physical materials around us, be they food items, electronics or cleaning products.

The everyday nature of household waste — what we buy, use and discard — is also inextricable from major global challenges that define our age. Differing levels of energy and raw materials are needed for production, and when these materials eventually become waste, they can be disposed of in radically different ways. As such, the question of how people handle waste is inescapably linked to how we tackle climate change, biodiversity loss and environmental pollution¹.

When household waste is thrown away, it does not always stay neatly contained within national boundaries. Waste is shipped around the world, from country to country, across borders, rivers and oceans. Residual products of household waste in the form of emissions (for example, through dump sites or open burning) can enter the atmosphere and affect people far from the source of initial disposal. As the World Bank's *What a Waste 2.0* report notes:

“Poorly managed waste is contaminating the world’s oceans, clogging drains and causing flooding, transmitting diseases via breeding of vectors, increasing respiratory problems through airborne particles from burning of waste, harming animals that consume waste unknowingly, and affecting economic development such as through diminished tourism.”

Moreover, a global economy increasingly based on minerals has exacerbated the challenges of harmful waste streams and rising pollution from municipal waste. The global challenge of waste is also closely linked to broader public health concerns around air and water quality and, therefore, is closely tied to safety in people's daily lives.

The world today faces a major challenge in managing household waste, and this challenge will only continue to grow. According to the United Nations Environmental Programme (UNEP), more than two billion tonnes of municipal solid waste are produced worldwide every year. If urgent action is not taken to address the ballooning volume of household waste, UNEP² and the World Bank³ estimate that this figure will swell to between 3.4 and 3.8 billion tonnes by 2050.

As populations become wealthier and more urbanised, their consumption patterns and waste-related behaviours also change. High-income countries consume materials at a far greater rate than low-income countries⁴. In general, the combination of more varied product choices and higher disposable incomes often translates into an increase in the volume of waste per capita. If the world does produce 3.8 billion tonnes of municipal waste in 2050, UNEP estimates that gross domestic product (GDP) growth could be the major contributor to this increase.



“Poorly managed waste is contaminating the world’s oceans, clogging drains and causing flooding, transmitting diseases ... increasing respiratory problems through airborne particles from burning of waste, harming animals that consume waste unknowingly, and affecting economic development ...”

What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. World Bank Group, 2018.

Managing the burden of global household waste involves several key mechanisms, including international agreements, national and local governments, the private sector, non-governmental organisations and individuals. The challenge of waste is not only one of volume but also of its heterogeneous and variable composition. As such, the three principles of 'reduce, reuse and recycle' are an important part of tackling problems caused by the waste crisis. Accurate data on material composition, recycling and separation practices, and disposal methods, therefore, are critical to effectively managing waste disposal today and in the future.

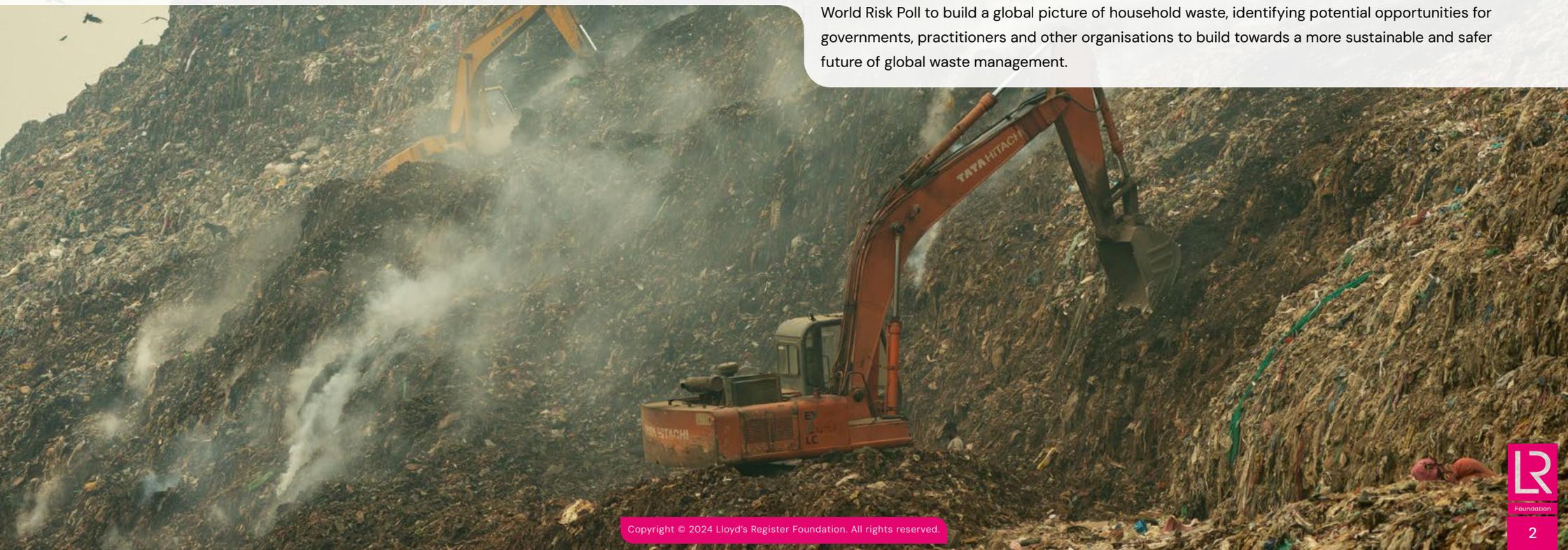
While recent UNEP and World Bank reports hold immense value for their data on the types of waste disposed of globally in terms of volume and overall composition, this study of waste in the World Risk Poll measures a different (albeit closely related) concept. It is the first global study measuring self-reported and experiential individual behaviours and perceptions concerning household waste. The 2023 World Risk Poll introduced three questions asking people around the world about their household waste practices: what type of material they discard most commonly, whether they separate their rubbish and how that rubbish is removed from their household. These questions provide a new source of quality global data on the topic, one reported by the people themselvesⁱ.

ⁱ - It is worth noting that these findings about household waste are based upon individuals' perceptions. For simplicity and clarity, this report will frequently refer to a certain 'percentage of households'; this refers to a percentage of people evaluating what happens in their households rather than reflecting the views of all members in every household.

The self-reported data, representing more than 95% of the world's adult population, highlight nuances of household waste disposal practices on a global scale, an angle not extensively covered by other major reports that focus primarily on overall waste volumes and composition. This report offers a valuable new perspective to policymakers when designing interventions at various levels, from the local to the global, as it gives the important perspective of people's lived experiences. Managing household waste more sustainably is a balance between people's willingness to adopt certain behaviours — such as reducing consumption, reusing products and recycling — and government's ability to implement policies that help them do so.

An important consideration when reading this report is that it focuses solely on household waste. Huge volumes of non-household waste are produced each year as by-products of industry, agriculture, construction and healthcare, as well as contributions from other businesses, which do not form part of this analysis. As the World Risk Poll is a nationally representative survey of randomly selected individuals, it is unable to measure waste disposal outside of the household, which itself is only part of all waste produced on earth.

The report first examines household waste materials — what is thrown away, where and by whom. Chapter Two explores patterns in household separation of waste (pre-collection/disposal) and the link between waste separation and concern over climate change. Chapters Three and Four analyse two of the most common forms of waste disposal globally: open burning and controlled collection. Chapter Five takes a step back by combining all three waste questions asked in the World Risk Poll to build a global picture of household waste, identifying potential opportunities for governments, practitioners and other organisations to build towards a more sustainable and safer future of global waste management.



2. The material world

Household waste comes in many forms. Given the heterogeneity in household waste between and within countries, the first waste question asked in the World Risk Poll was intentionally open-endedⁱ:

Please think about your household waste and garbage, including recyclable waste. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?

The interviewer then coded the open-ended responses into the following list:

- Plastic bottles, plastic wrapping, any plastic product, nylonⁱⁱ
- Food waste, food peel, organic food-related waste, wet or dry food waste, cooked or uncooked food waste
- Cardboard, paper, paper-based packaging
- Cans, metals
- Household dust, leaves or branches/twigs, mud, soil
- Ash from burning wood or coal
- Glass containers or glass products
- Other
- (Don't know/Refused)ⁱⁱⁱ

These data record only the most common type of material thrown away — or what the respondent believes to be the most typical form of waste — and do not account for each household's full waste material mix.

ⁱ - In China, where Gallup collected data via web (rather than via interviewer-administered telephone or face-to-face modes), this question was asked as a closed-end (multiple-choice) question. The response options were identical to those listed here, though respondents could not say "don't know" or refuse to answer the question.

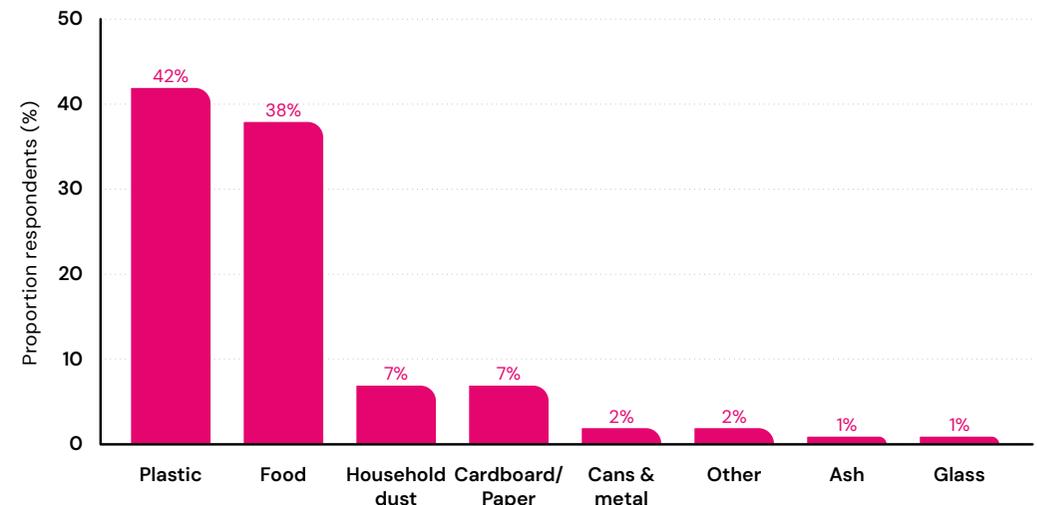
ⁱⁱ - Henceforth referred to as 'plastic,' 'food waste,' 'cardboard/paper,' 'cans,' 'household dust,' 'ash' and 'glass.'

ⁱⁱⁱ - Answers in brackets are volunteered responses, and not read out by the interviewers.

What people say their households throw away

Globally, plastic is the most commonly reported primary waste material for 42% of households, followed by food-related waste at 38%. In sum, these two types of material are the dominant forms of waste for four in five households worldwide. Household dust, leaves, branches/twigs, mud or soil^{iv}, and cardboard/paper comprise a considerably smaller proportion of households' primary waste, at 7% each. Cans and metals stand at 2%, ash and glass at 1% each, and other forms of household waste were also mentioned but to a much lesser degree, accounting for 2% of the total.

Chart 2.1. Most commonly reported primary material in household waste globally



Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?

Plastic has its advantages and disadvantages. While it is light, convenient, inexpensive, durable and used across many sectors, its success comes at a significant cost. Large amounts of oil and gas are needed to produce plastic⁵; UNEP's Global Resource Outlook estimates that the production of plastics contributes 4.5% of all global climate impacts⁶. When plastic is mismanaged, it becomes a significant environmental pollutant⁷: each day, enough plastic is dumped into the world's water supplies to fill 2,000 garbage trucks⁸. Plastic also takes decades to break down, a process that leads to the generation of micro-plastics — which are of increasing concern for the health of the environment and humans alike⁹.

^{iv} - Referred to as 'household dust' in **Chart 2.1** for clarity.

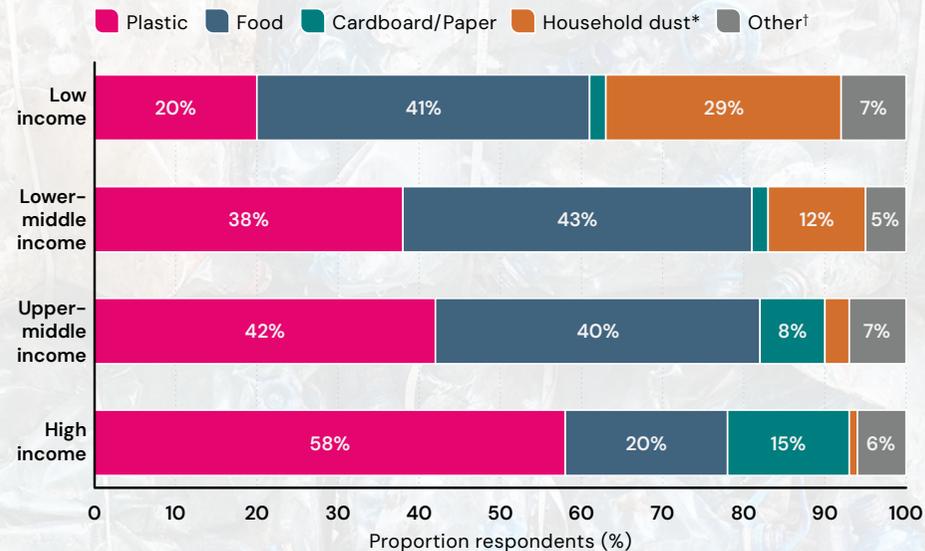
Although many types of plastic can be recycled, they often are not. According to the UN, less than 10% of single-use plastics have ever been recycled¹⁰. There are several reasons for such low recycling rates, including a lack of public awareness, minimal standardisation in the recycling process and market fluctuations¹¹. Proper plastic management is crucial to preventing leakage into the environment, reducing the overall demand for the material, minimising risks to public health associated with its disposal and, ultimately, engineering a safer world¹².

There are also serious negative consequences associated with other types of waste. For example, many inputs and resources — such as water, energy and fuel — are needed to produce, transport and prepare food. All these resources used to produce food are wasted when it is thrown away. Beyond wasting input resources, food waste also releases methane gas when it sits in landfill, a far stronger greenhouse gas than carbon dioxide¹³. Reducing overconsumption and food waste is also a core part of policy packages and social shifts proposed by the UN to place less strain on resources and biodiversity¹⁴.

What do households in different countries and regions throw away the most?

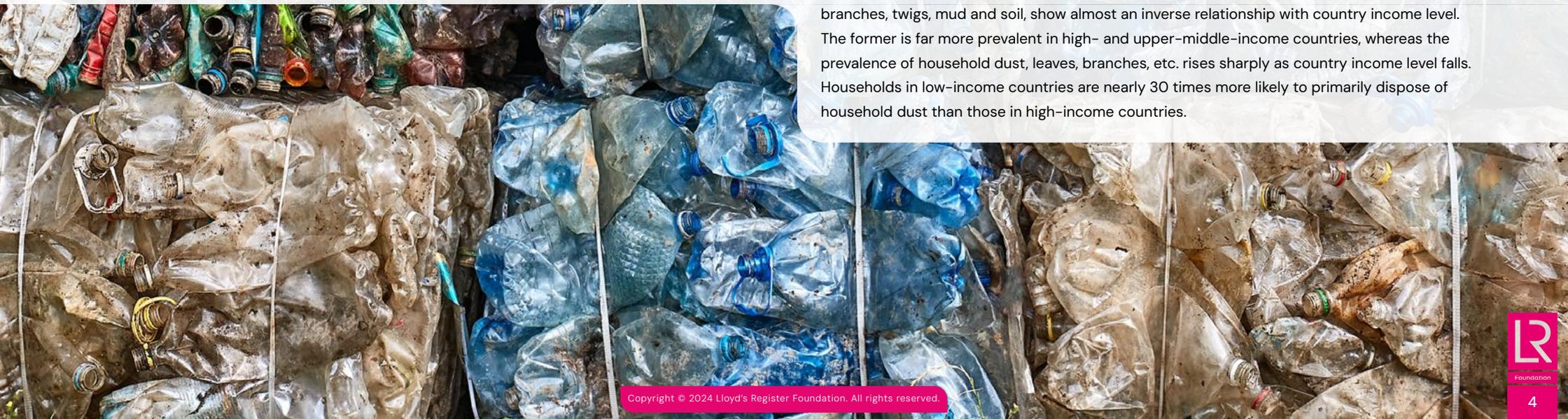
A country's wealth plays a key role in the types of material its households throw away. While plastic is the most commonly reported primary material in global household waste, this finding only holds in high-income countries (where 58% of individuals say their households' main waste material is plastic). In upper-middle and lower-middle-income countries, plastic and food-related waste are nearly tied (42%-40% and 38%-43%, respectively) as the primary materials in household waste (see [Chart 2.2](#)). In low-income countries, just 20% of households report primarily disposing of plastic waste relative to other materials.

Chart 2.2. Most common type of material reported in household waste globally, by World Bank country income level



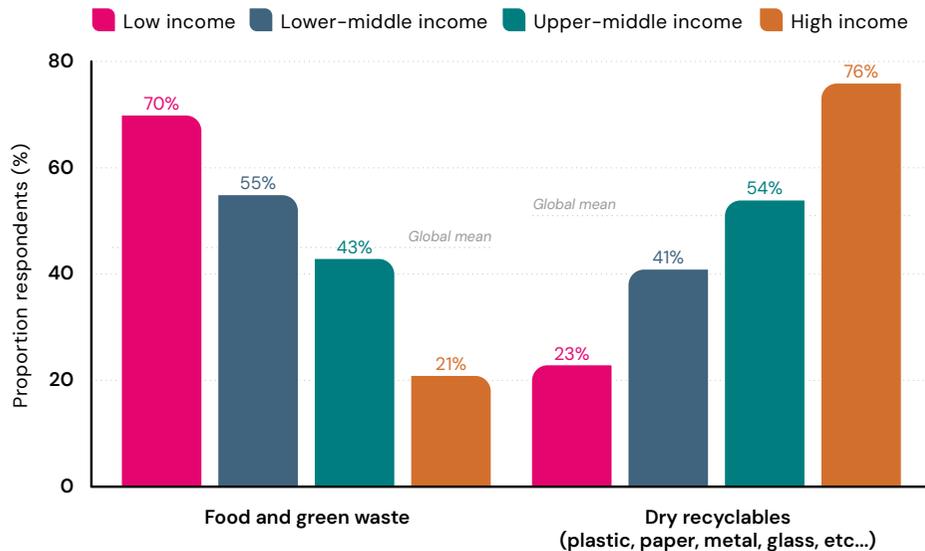
Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else? *Household dust also includes leaves, branches, twigs, mud, soil. †Includes cans and metal, ash, glass, other, don't know, and refused.

In high-income countries, only one in five households (20%) consider food waste (including wet and dry, cooked and uncooked, as well as peel/off-cuts and other organic food-related waste) as the primary waste category generated in their household. This figure rises to around two in five households in all other income categories. Cardboard/paper, and household dust, leaves, branches, twigs, mud and soil, show almost an inverse relationship with country income level. The former is far more prevalent in high- and upper-middle-income countries, whereas the prevalence of household dust, leaves, branches, etc. rises sharply as country income level falls. Households in low-income countries are nearly 30 times more likely to primarily dispose of household dust than those in high-income countries.



The relationship between country income level and waste material becomes clearer when materials are combined into broader categories. Several types of materials measured in this survey can be grouped together as ‘dry recyclables’, comprising plastic, cardboard/paper, metal and glass. These materials, under certain — but not all — circumstances, could be recycled. Crucially, their ‘recyclability’ also depends on people choosing to recycle them if the option is available. While recycling is an essential component of waste management, more sustainable practices should go beyond recycling and aim to keep materials in use for as long as possible¹⁵. These include redesigning products to last longer, extended producer responsibility — an approach that makes producers responsible for the end-of-life of their products — and advanced recycling techniques that can extend material life cycles, thereby contributing to carbon neutrality and resource efficiency.

Chart 2.3. Most common categories of material reported in household waste globally, by World Bank country income level



Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?

In contrast, food waste and household dust can be grouped as ‘food and green waste’. These categories are intentionally broad but show the similarities in measurement between the World Risk Poll and the World Bank *What a Waste 2.0* report. According to the latter, food and green waste comprise 44% of global waste. The World Risk Poll finds that 45% of individuals globally live in households that report primarily disposing of food and green waste.

The wealthier a country is, the more likely it is that dry recyclables form the dominant composition of household waste. The less wealthy a country is, the more likely it is that food and green waste are the most discarded household materials relative to dry recyclables. Single-use products and packaging are more common in higher-income countries, where more people tend to live further away from where products (especially food) are produced and prioritise convenience in their purchase decisions¹⁶. By contrast, people in low-income countries are proportionately more likely to live in rural areas — closer to the sources of food production — minimising the need for dry recyclables in transporting and packaging their food¹⁷.

“The wealthier a country is, the more likely it is that dry recyclables form the dominant composition of household waste.”

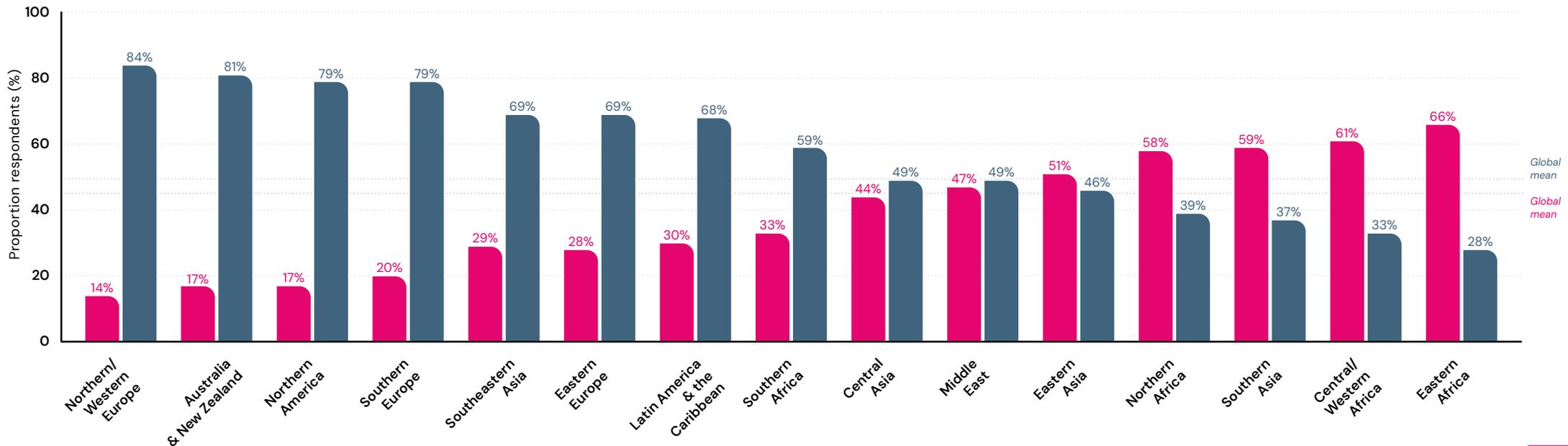
This is broadly reflected in the regional analysis of household waste composition. Five regions (Eastern, Central/Western and Northern Africa and Southern and Eastern Asia) see higher rates of disposal of food and green waste as the primary material in household waste. Households in the Middle East throw away dry recyclables and food and green waste at similar rates, while all other regions skew towards dry recyclables. Around four in five households across Northern, Western and Southern Europe, Australia and New Zealand, and Northern America primarily throw away dry recyclables.

There is much geographic variation when it comes to the most commonly reported materials in household waste. Five of the top 10 countries with the highest proportion of people living in households where plastic is the most common type of waste are in Europe, and three are in Southeastern Asia, with El Salvador and Eswatini also on the list. Cambodia¹⁸, Myanmar¹⁹ and Eswatini²⁰ – the three lower-middle-income countries that feature in the top 10 – all have significant plastic waste challenges due to many factors, including economic development, population growth and insufficient infrastructure. Eswatini recently voted to ban single-use plastic bags to combat the challenge²¹.



Chart 2.4. Most common categories of material reported in household waste, by region

■ Food and green waste ■ Dry recyclables



Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?

The fact that lower-income countries feature in the top 10 list for households reporting plastic as the primary material in their household waste is significant from a policy perspective. Such countries generally lack the same levels of recycling infrastructure as high-income countries to deal with plastic waste. As such, policymakers in these countries need to encourage a reduction in plastic disposal and develop sufficient recycling infrastructure to cope with it.

Globally, food waste is the biggest primary component of household waste in many lower-income countries, but highest in the Democratic Republic of the Congo (79% of households), Cote d'Ivoire (76%) and Gabon (75%), with other countries from the Middle East, Northern Africa and Asia rounding out the top 10. Aside from Afghanistan (45%), the top 10 countries reporting household dust as the most common waste material are all in Africa, whereas cardboard/paper skews heavily towards high-income countries in Europe and Northern America.

Table 2.1. Top 10 countries/territories where each waste material is most commonly disposed of

| Plastic | Food-related | Household dust* | Cardboard/paper |
|---------------------|--------------------|-------------------|-------------------|
| Slovenia: 83% | D.R. Congo: 79% | Ethiopia: 58% | Iceland: 36% |
| Czech Republic: 81% | Cote d'Ivoire: 76% | Afghanistan: 45% | Sweden: 26% |
| Eswatini: 79% | Gabon: 75% | Sierra Leone: 40% | U.S.: 23% |
| El Salvador: 78% | Morocco: 72% | Malawi: 34% | U.K.: 22% |
| Netherlands: 78% | Lebanon: 71% | Niger: 34% | Ireland: 22% |
| Belgium: 78% | Kuwait: 70% | Zimbabwe: 33% | Canada: 20% |
| Cambodia: 78% | Pakistan: 68% | Burkina Faso: 28% | Taiwan (PoC): 19% |
| Italy: 76% | Azerbaijan: 68% | Chad: 26% | Austria: 19% |
| Myanmar: 76% | Malaysia: 63% | Zambia: 23% | Australia: 17% |
| Indonesia: 76% | Israel: 61% | Mali: 20% | Croatia: 17% |

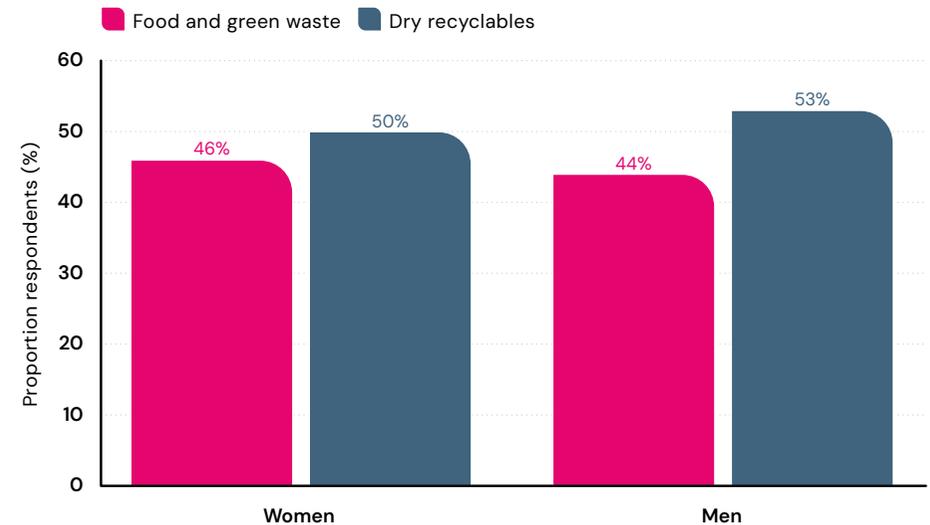
Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else? *Household dust also includes leaves, branches, twigs, mud, soil.

Who throws what away? Differences by key demographic groups

Household waste is complex in composition and geographic variation, and household waste practices also vary at the individual level. It is important to note that the World Risk Poll module on waste — while collected at the individual level — framed questions around households, not individuals. As such, there are not radically different figures between demographic groups, as people are describing their household, not individual waste practices — though some people may not be as well informed about these matters as others.

That said, men and womenⁱ have differing perceptions of the household waste mix. At a global level, men are more likely than women (53% vs. 50%) to report that dry recyclables are the primary form of waste in their household, while women are slightly more likely to report food and green waste as the primary form. In some regions, such as Eastern Asia, Central Asia and Eastern Europe, the gap between men and women increases to more than five percentage points.

Chart 2.5. Global differences in primary reported form of household waste, by gender



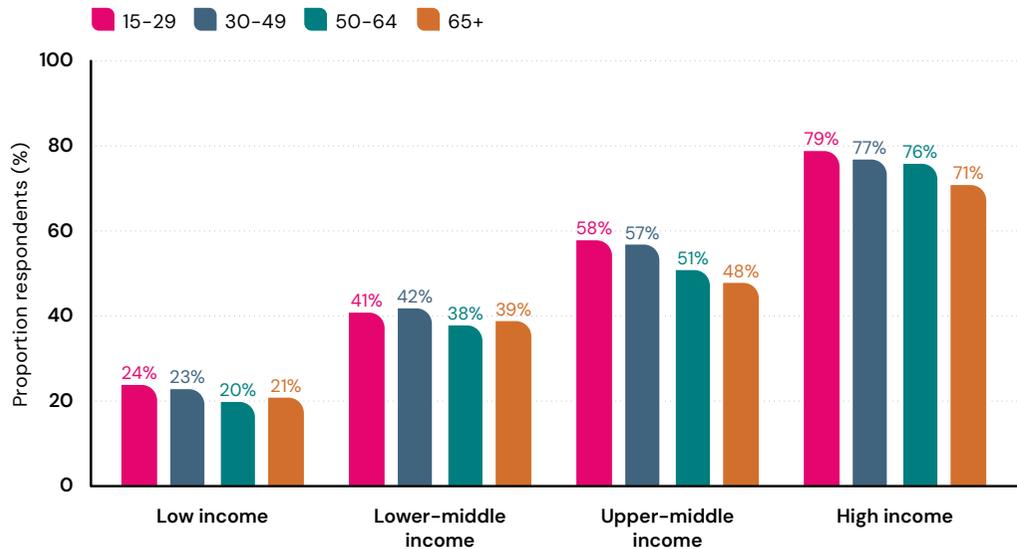
Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?

ⁱ – The specific question was framed as sex as the demographic, but this report refers to gender (men and women) as opposed to sex (males and females) for general readability.

Ten countries — Thailand, Malta, Mozambique, Bosnia Herzegovina, Jordan, Mauritania, Burkina Faso, United Arab Emirates, Ukraine and Kyrgyzstan — see differences of 10 percentage points or more in men being more likely than women to report living in households that primarily dispose of dry recyclables. By contrast, only Yemen has an equivalent gap in the opposite direction, where women are 10 percentage points more likely than men to report living in households that primarily dispose of dry recyclables.

There is also a relationship between age and waste materials in high- and upper-middle-income countries. In these countries, as age increases, the proportion of households throwing away primarily dry recyclables decreases. However, the relationship between age and dry recyclables is much flatter in lower-middle- and low-income countries.

Chart 2.6. Percentage of households globally whose primary reported form of waste is dry recyclables, by age and World Bank country income level



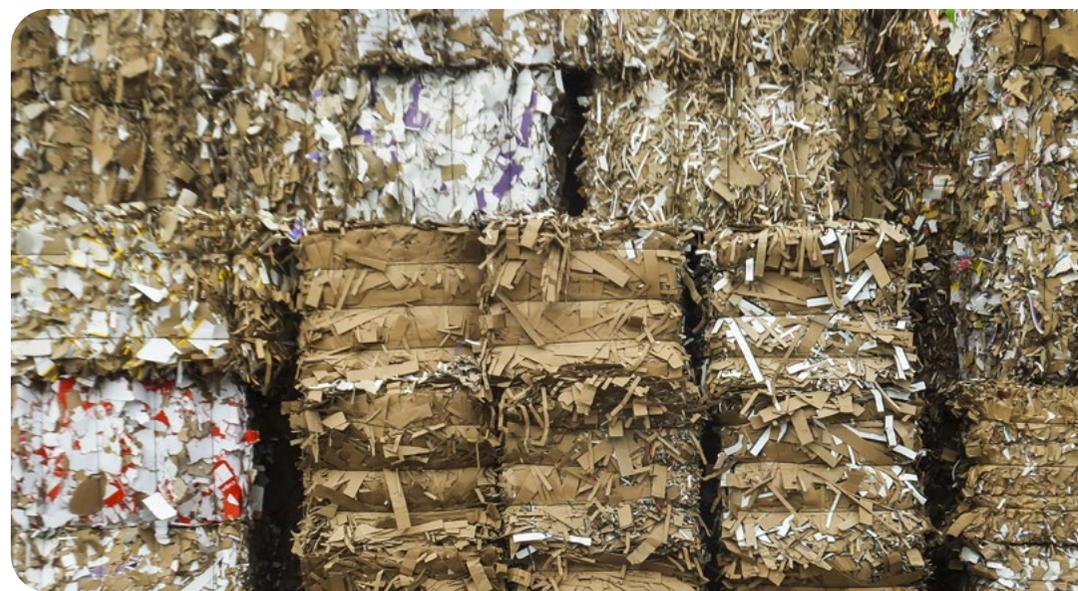
Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?

Five countries and territories stand out for having the most significant material differences between people aged 15 to 29 and those over 65. In Bulgaria, Taiwan (Province of China), Mauritius, Slovakia and Portugal, the gap between younger and older people in disposing of dry recyclables is more than 25 percentage points.

Table 2.2. Countries/Territories with the largest age gaps among people who report primarily disposing of dry recyclables

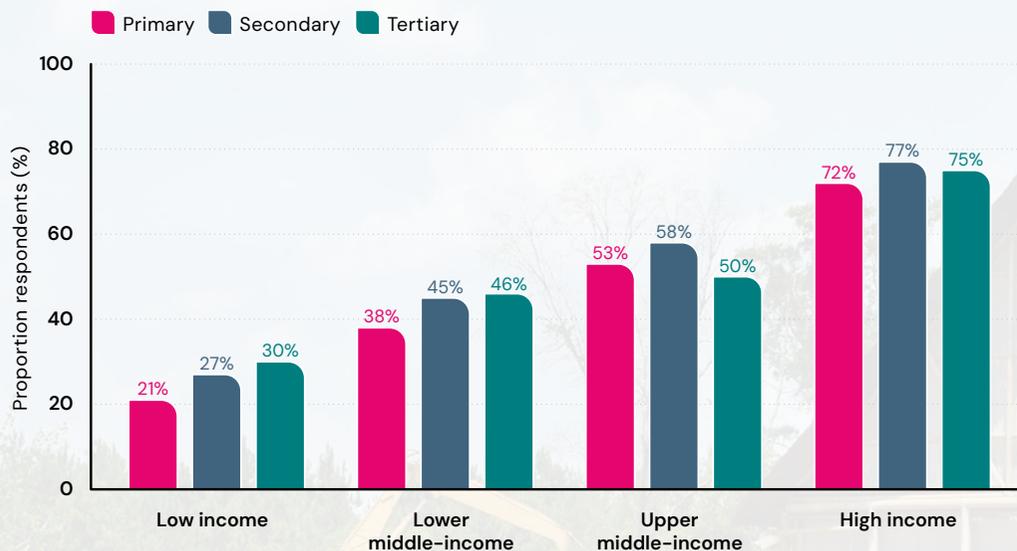
| Country/Territory | 15-29 | 65+ | Percentage-point difference |
|-------------------|-------|-----|-----------------------------|
| Bulgaria | 82% | 42% | 40 |
| Taiwan (PoC) | 85% | 55% | 30 |
| Mauritius | 57% | 27% | 30 |
| Slovakia | 70% | 43% | 27 |
| Portugal | 83% | 57% | 26 |

Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?



Globally, people with higher levels of education are also more likely to live in households where dry recyclables are the dominant form of household waste. But again, this relationship differs by country income level. Higher levels of education are much more closely related to the disposal of dry recyclables in low- and lower-middle-income countries than in wealthier ones.

Chart 2.7. Percentage of households globally whose primary form of waste is dry recyclables, by education and World Bank country income level



Survey question: Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?

It is worth noting that education is often tied to other demographic variables, such as urbanicity and incomeⁱ. At a global level, dry recyclables form a similar percentage of primary household waste in cities (52%) and rural areas (50%). The biggest difference in urbanicity and waste composition is in low-income countries, where dry recyclables (often plastic) are much more commonly found in cities (31%) than in rural areas (19%).

This chapter gives a high-level overview of the materials that comprise global household waste. While there are substantial local and regional differences in how people throw away their rubbish, one key theme that emerges is the importance of income, specifically at the country level.

Material composition is just one part of the global waste equation. In addition to understanding what people throw away, it is equally important to know how they dispose of materials. The dominant form of global household waste — plastic — is, in many cases, recyclable. But just because it can be recycled doesn't mean it always is. To recycle plastics or other materials such as cardboard/paper, metal and glass, waste must be clearly separated from other non-recyclable materials.

ⁱ - In many parts of the world, people with higher levels of education gravitate toward living in cities and earning higher incomes.



3. Dividing lines in waste separation

Collecting household waste is crucial for preventing disposal methods that harm people's health and the environment, such as open dumping or open burning (covered in more detail in later chapters). Separating waste can directly contribute to meeting climate mitigation goals because of its links to reducing greenhouse gas emissions and conserving natural resources. But for household waste collection to provide the most value, waste must first be separated into different containers depending on the materials involved²².

Separation is crucial to maximise the potential value of recycling and to reduce the volume of waste entering landfills. The European Environment Agency²³ notes:

“Well-designed separate collection systems for municipal waste are a key enabler of high recycling rates and the collection of recyclables of adequate quality.”

There are, however, several barriers to separating waste, including low household awareness of the importance of separation, logistical challenges, lack of infrastructure and the extra capacity required to keep materials separate in different containers and prevent cross-contamination²⁴, as well as broader socioeconomic factors.

“ Well-designed separate collection systems for municipal waste are a key enabler of high recycling rates and the collection of recyclables of adequate quality. ”

Economic Instruments and Separate Collection Systems – Key Strategies to Increase Recycling. European Environment Agency, 2024.

The World Risk Poll asked respondents the following question on separation:

When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not? For example, separating plastics and food waste by putting them in separate bags or containers?

- Yes
- No
- (Sometimes)ⁱ
- (Don't know/Refused)

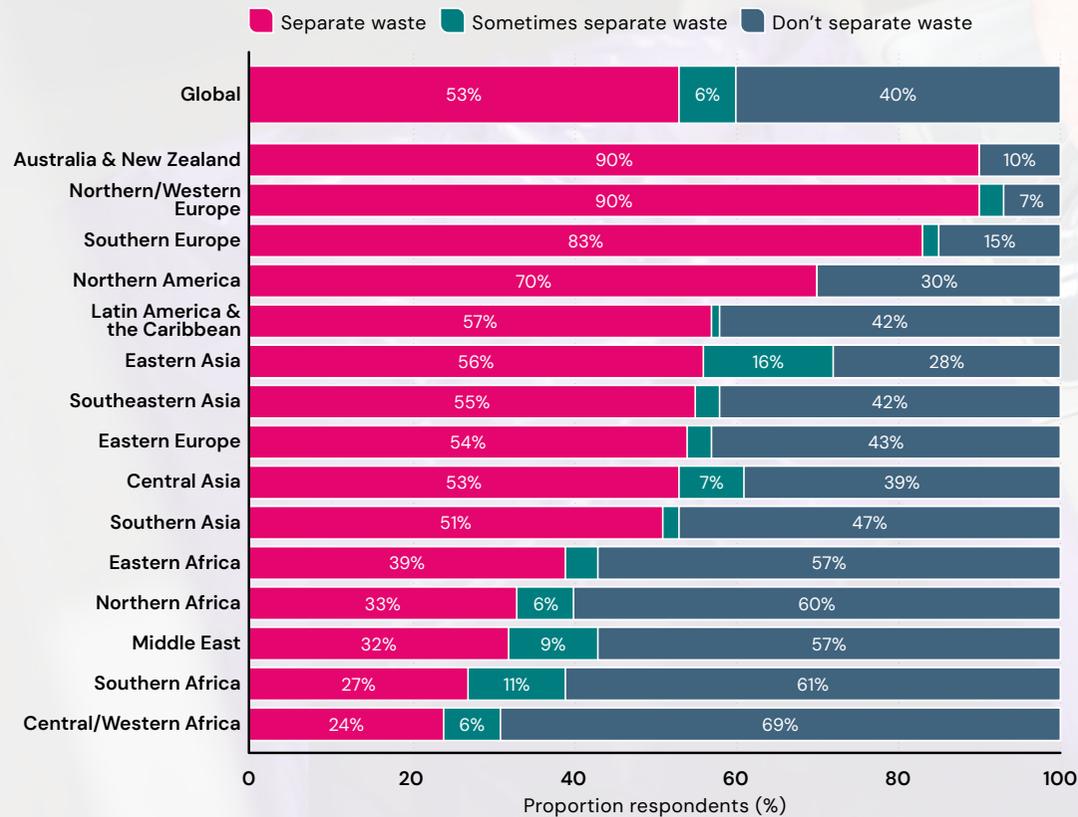
At a global level, slightly over half (53%) of households report separating their waste before disposal, compared to 40% of households that do not and 6% that sometimes separate their waste. Again, this global figure belies significant dividing lines in how different groups of people separate their waste. These gaps exist across countries, demographics and attitudes toward climate change and must be closed if humanity is to alleviate the growing burden of municipal waste. To promote more sustainable waste disposal practices at the household level, there is much work to do in providing the proper infrastructure to make it easier for people to separate their waste²⁵.



ⁱ - Answers in brackets are volunteered responses, and not read out by the interviewers.

Separating waste before disposal is an almost universal behaviour in some regions. In Australia and New Zealand and Northern and Western Europe, nine in 10 households separate their waste. Across Asia, narrow majorities of households separate their waste in the Eastern (56%), Southeastern (55%), Central (53%) and Southern (51%) regions. Africa and the Middle East are the only regions where majorities of households do not separate their waste. Southern (27%) and Central/Western (24%) Africa report the lowest rates of household waste separation.

Chart 3.1. Percentage of households that separate their waste before disposal, by region

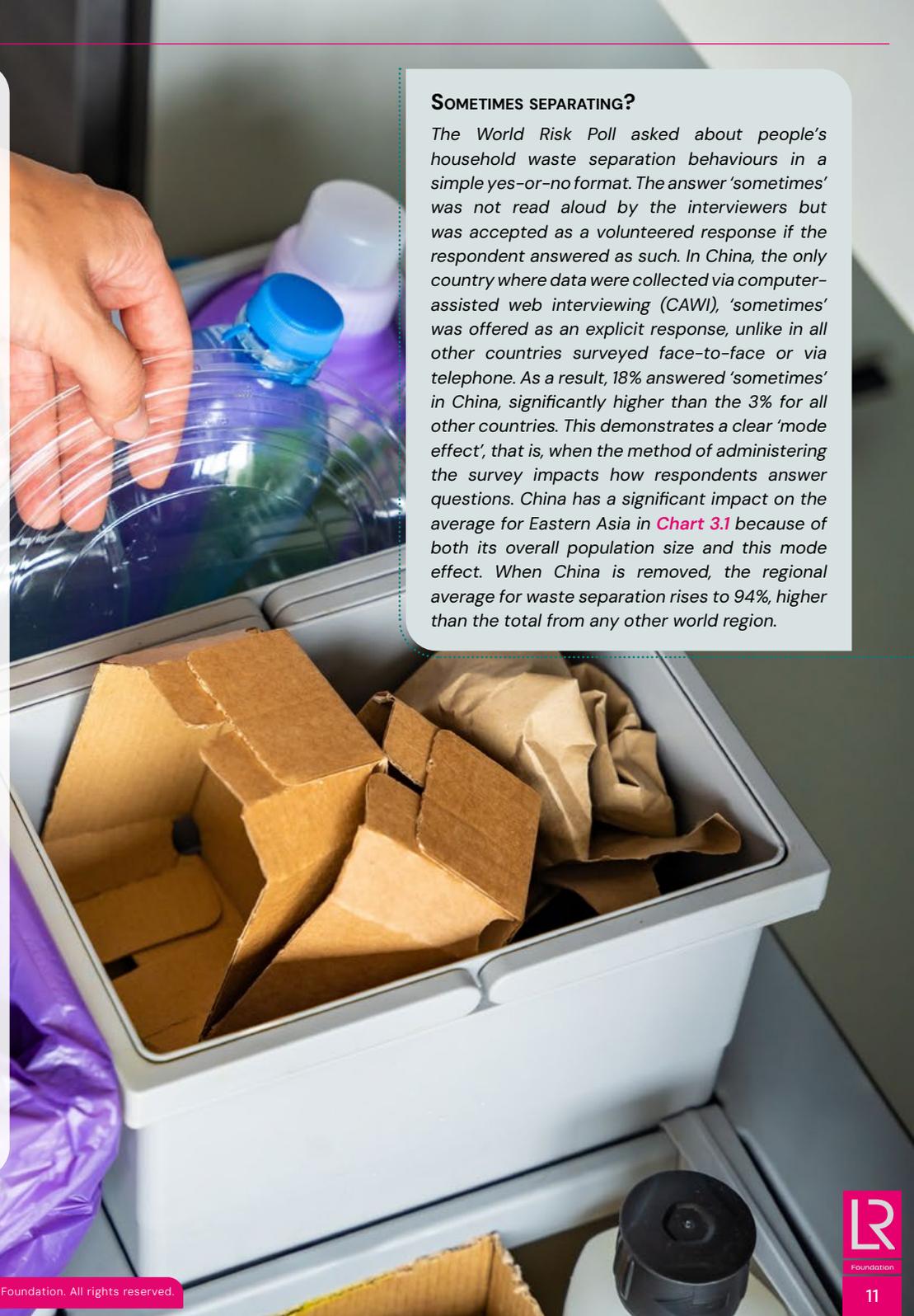


Survey question: When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not? For example, separating plastics and food waste by putting them in separate bags or containers?

Note: Percentage values below 5% are not displayed. In all countries except China, 'sometimes' was accepted as a volunteered response, but the answer option was not explicitly provided to the respondent. In China, where interviewing was self-administered, 'sometimes' appeared as an answer option. Percentages may not add up to 100 due to rounding.

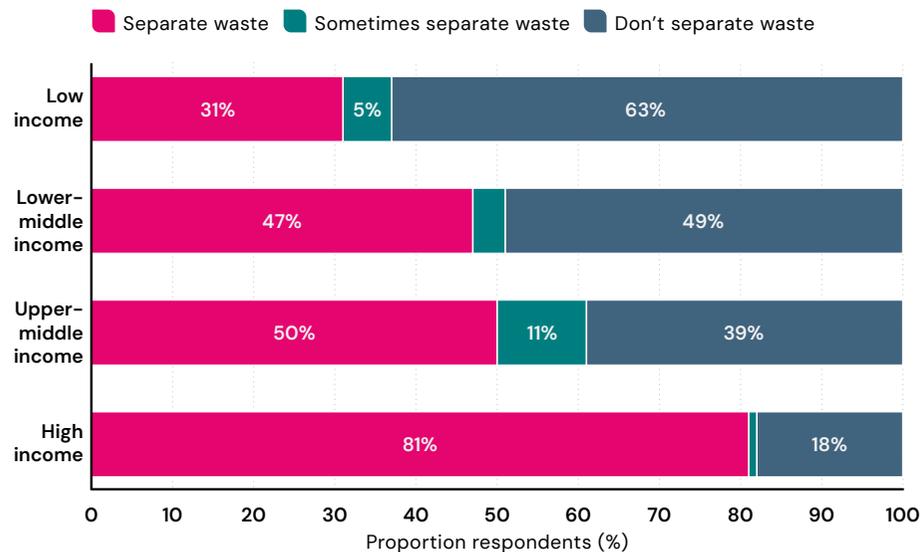
SOMETIMES SEPARATING?

The World Risk Poll asked about people's household waste separation behaviours in a simple yes-or-no format. The answer 'sometimes' was not read aloud by the interviewers but was accepted as a volunteered response if the respondent answered as such. In China, the only country where data were collected via computer-assisted web interviewing (CAWI), 'sometimes' was offered as an explicit response, unlike in all other countries surveyed face-to-face or via telephone. As a result, 18% answered 'sometimes' in China, significantly higher than the 3% for all other countries. This demonstrates a clear 'mode effect', that is, when the method of administering the survey impacts how respondents answer questions. China has a significant impact on the average for Eastern Asia in **Chart 3.1** because of both its overall population size and this mode effect. When China is removed, the regional average for waste separation rises to 94%, higher than the total from any other world region.



Looking at the data by country income groups, **Chart 3.2** shows that higher-income countries see significantly higher rates of waste separation than lower-income countries. Households in countries classified as high-income by the World Bank are more than two and a half times as likely to separate their waste as those in low-income countries (81% vs. 31%, respectively). There is considerably less variation between upper- and lower-middle-income countries, where 50% and 47% of households separate their waste. From a policy and communications perspective, this finding suggests that in lower- and middle-income countries, messaging could focus more on getting people to separate in the first place. In high-income countries, where separation rates are significantly higher, communications could be focused on ensuring separation is done correctly and should be easily understood across different regions and waste collection jurisdictions.

Chart 3.2. Percentage of households globally that separate waste before disposal, by World Bank country income level



Survey question: When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not? For example, separating plastics and food waste by putting them in separate bags or containers?
 Note: Percentage values below 5% are not displayed. Percentages may not add up to 100 due to rounding.

The 10 countries or territories with the highest rates of waste separation are all in Europe or Eastern Asia. Separation is nearly universal among these countries. At the other end of the spectrum, seven of the top 10 countries where the fewest households report separating their waste are in sub-Saharan Africa. The other three – Kosovo, Montenegro and Albania – are in Eastern Europe.

Kosovo, Montenegro and Albania all face significant challenges due to domestic waste. Kosovo lacks any form of proper waste management for its domestic (or other) refuse²⁶. In Montenegro, separation is not effective because recyclable waste is often not sorted post-collection, and people are given no incentives to separate waste at the source²⁷. Likewise, in Albania, there are few structures in place to enforce or incentivise separation and recycling, and any separation that is done is mostly informal²⁸. In general, the picture of global separation habits is largely defined by geography and national income.

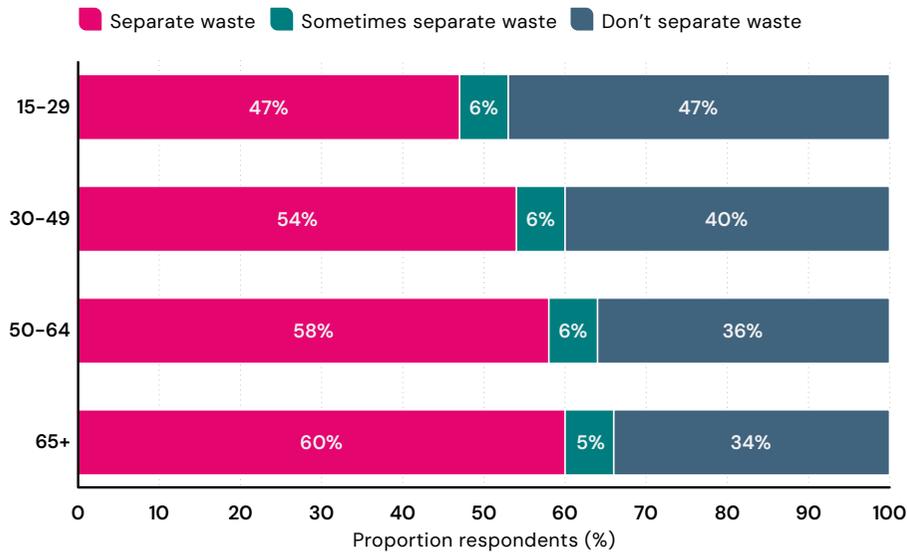
Table 3.1. Top 10 countries/territories that do or do not separate their household waste before disposal

| % Yes | % No |
|---------------------|----------------------------|
| South Korea: 99% | Gabon: 88% |
| Iceland: 98% | Cote d'Ivoire: 85% |
| Belgium: 98% | Kosovo: 84% |
| Italy: 98% | Togo: 83% |
| Slovenia: 98% | Cameroon: 80% |
| Malta: 98% | Benin: 80% |
| Taiwan (PoC): 97% | Liberia: 79% |
| Czech Republic: 97% | Republic of the Congo: 79% |
| Luxembourg: 96% | Montenegro: 78% |
| Sweden: 96% | Albania: 78% |

Survey question: When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not? For example, separating plastics and food waste by putting them in separate bags or containers?

At the same time, there are signs that personal characteristics may matter, too, though not to the same extent. Young adults globally — those between the ages of 15 and 29 — are equally as likely to separate their waste as not (47% each). As age increases, so does waste separation, rising to 60% among the over-65 age group.

Chart 3.3. Percentage of households globally that separate their waste before disposal, by age

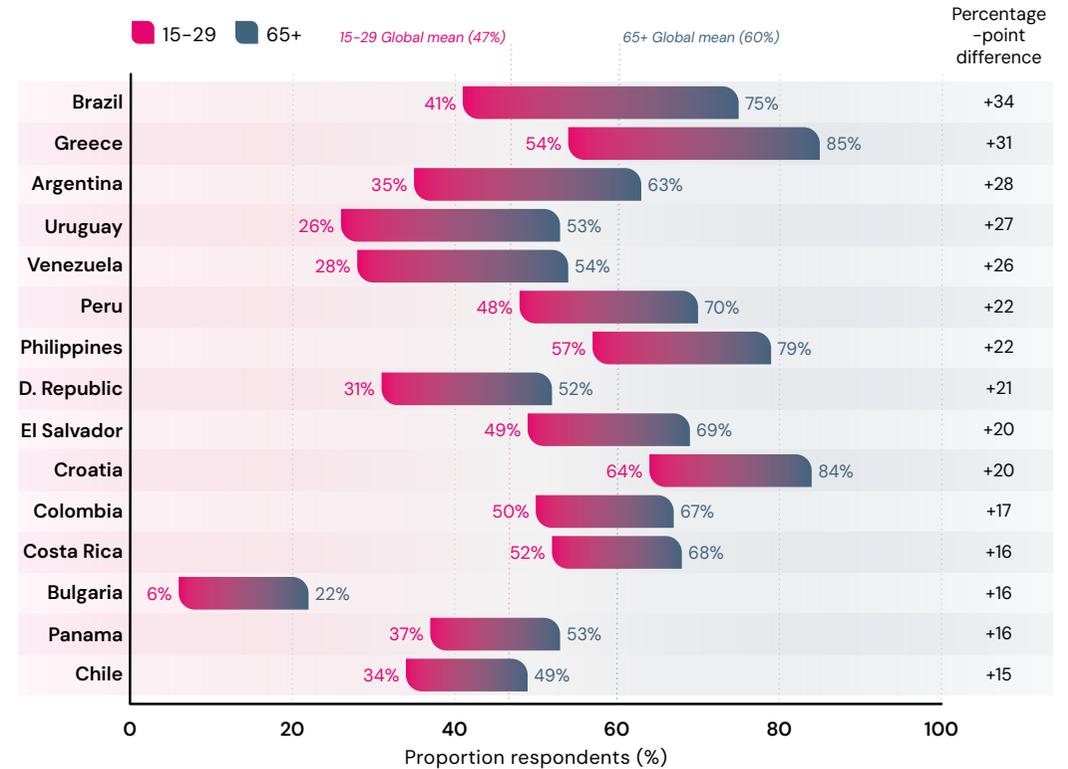


Survey question: When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not? For example, separating plastics and food waste by putting them in separate bags or containers?

Note: Percentages may not add up to 100 due to rounding.

Some regions are home to particularly sharp age divides in waste separation. While Latin America and the Caribbean performs slightly better than the global average in terms of household waste separation (57% vs. 53%, respectively), many countries that exhibit the largest age gaps in separation are found in this region. Of the 15 countries with the biggest gaps in reported waste separation between people aged between 15 and 29 and those over the age of 65, 11 are in Latin America and the Caribbean. Even with the region's above-average separation rate, there is still considerable headroom to improve awareness of the importance of separating waste among Latin America's younger population and conduct further research into the divides in separation between young and old.

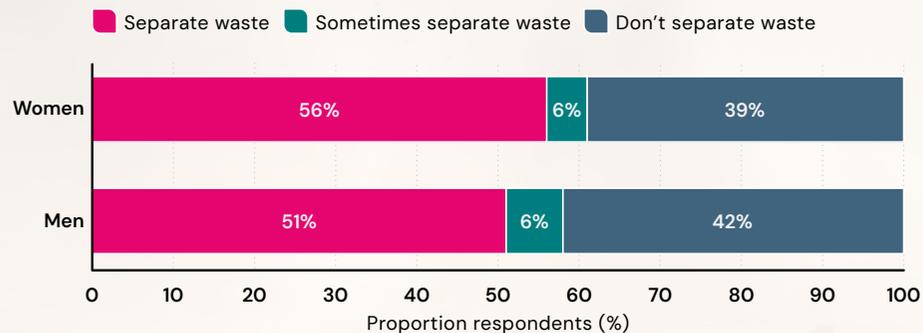
Chart 3.4. Top 15 countries with the largest gaps in separating household waste between those aged 15-29 and 65+



Survey question: When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not? For example, separating plastics and food waste by putting them in separate bags or containers?

There are also significant differences between men and women in separating household waste. Globally, women are more likely than men (56% vs. 51%) to report separating their household waste before disposal, and gaps tend to be higher in upper-middle-income (53% vs. 47%) and lower-middle-income (50% vs. 45%) countries. In many societies, women are primarily responsible for everyday purchase decisions, domestic cleaning, and handling and managing household waste²⁹, perhaps helping to explain gender differences in perceptions on the topic.

Chart 3.5. Percentage of households globally that separate their waste before disposal, by gender



Survey question: When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not? For example, separating plastics and food waste by putting them in separate bags or containers?

Note: Percentages may not add up to 100 due to rounding.

In some regions, men and women report very different behaviours around the separation of household waste, even though their perceptions of primary materials are very similar. For example, in Northern America, women are significantly more likely to report separating household waste than men (73% vs. 66%) even though their perceptions of the primary materials in their household waste are similar (78% vs. 80% dry recyclables). The same is true in Southern Asia, where women report separating waste more than men (53% vs. 48%) even though 36% and 37%, respectively, say the primary material in their household waste is a dry recyclable. Again, this demonstrates the different waste realities often faced by women and men in the same country's households and suggests targeted interventions could be needed for different sexes in some countries with the largest divides in separation.

Education level also shares a clear relationship with waste separation at the global level. Almost two-thirds (64%) of people with tertiary education report separating their waste, compared to 55% of those with secondary and 49% with primary education. This finding overlays with the pattern of country income level (shown in [Chart 3.2](#)), as higher-income countries tend to be home to a higher percentage of more educated people. The relationship between tertiary education and waste separation is more pronounced within middle-income countries than high- or low-income countries.

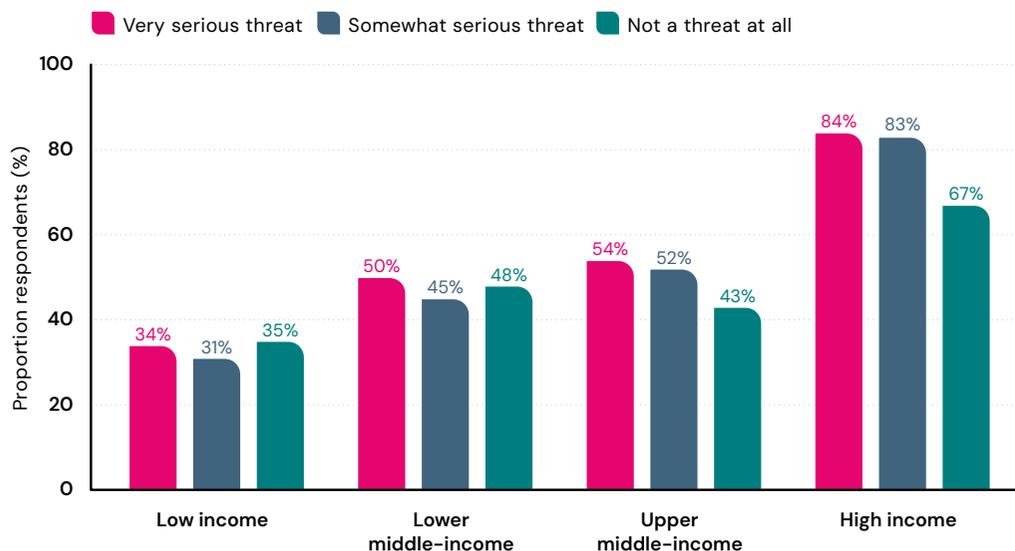


Waste separation and views on climate change

Previous research suggests a link between people’s worry about climate change and a greater willingness to recycle³⁰, a hypothesis backed, in part, by this research. The World Risk Poll asks respondents the extent to which they feel threatened by climate change. At a global level, 58% of people who think climate change is a ‘very serious’ threat to people in their country say they live in a waste-separating household, compared to 53% of those who think climate change is a ‘somewhat serious threat’ and 48% who say it is ‘not a threat at all’.

However, this relationship must be contextualised. Differences in separation by attitudes toward climate change are much more notable in high-income countries, where those who perceive climate change as a very or somewhat serious threat are significantly more likely to separate their household waste (84% and 83% respectively) than those who think climate change is not a threat at all (67%). The same pattern holds in upper-middle-income countries but not in lower-middle-income and low-income countries¹.

Chart 3.6. Percentage of households globally that separate their waste before disposal, by climate change concern and World Bank country income level



Survey question: When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not? For example, separating plastics and food waste by putting them in separate bags or containers?

¹ – In general, people in low-income countries are less likely to feel threatened by climate change (and more likely not to be sure how threatened they feel), even though many will be affected disproportionately by it. Researchers have hypothesised that more vulnerable people feel less threatened by long-term environmental concerns because of the greater number of short-term risks and challenges they face, such as being able to afford basic needs, getting a job or having access to healthcare.

Insight to action

This chapter demonstrates that although a majority of households worldwide report separating their waste, there is still significant room for improvement. Large divides in separation exist between — and within — countries. Increasing separation rates should be a primary focus in lower-income countries across Africa and Asia. Even in regions where separation rates are above the global average, such as Latin America and the Caribbean, there is still considerable work to do to promote and enable waste separation among younger generations.

Governments could provide greater incentives and infrastructure (including providing containers for separation, for example) and organise national and local public awareness campaigns. In some countries, such as Australia and the U.K., the merits of separating household waste and adopting more sustainable waste disposal practices have been integrated into school curricula, which should set the younger generation on a better trajectory of understanding the risks of unsustainable waste disposal methods. Governments, multilateral organisations and the private sector could also support specialised local NGOs that aim to aid local communities and engage with local schools to improve awareness of the direct benefits of sustainable waste disposal practices, such as the work done by Uganda’s Ecoaction³¹.

There are clear links between separating waste and helping to alleviate the burden of waste on the environment and climate. Separating household waste before disposal is a crucial step in the recycling process and helps maximise the volume of material recycled and reused, in turn minimising the volume that ends up in landfills, burnt or dumped. But alone, it is still insufficient. For the benefits of waste separation to be realised, effective waste collection structures and infrastructure must be in place to process household waste in different ways. This is not always the case.

4. The open burning of household waste

There are two main ways to categorise waste once it has left the house: controlled and uncontrolled³². Controlled waste is collected and then disposed of in a controlled way or recycled. By contrast, uncontrolled waste is either not collected and then burned or dumped, or collected but then burned or dumped in an uncontrolled fashion. As a result, the lines between the 'official collection' of waste from a household and what happens to the waste downstream in the process are somewhat unclear. Despite this grey area, higher-income countries tend to have more controlled disposal or recycling methods after household waste has been collected than lower-income countries.

Much like the first survey question on primary waste materials, the World Risk Poll also asked about waste disposal in an open-ended way:

After your household waste or garbage is taken outside of your home, what happens to it next?

Interviewers then coded the open-ended responses into one of the following categories:

- Someone from the household burns it
- A city garbage truck comes to collect it/the government is responsible for collecting it/is paid for with taxes
- Someone from a community group comes to collect it
- Someone from a private company comes to collect it on foot/bike/rickshaw/truck
- Someone from the household takes it to the trash/rubbish/landfill/tip
- Someone from the household throws it outside/in the street at the front or back of the home
- Other
- (Don't know/Refused)ⁱⁱ

i - Due to the use of self-administered web surveys for the purposes of data collection, participants of the World Risk Poll in China were asked to select 'the best response'. The answer options resembled the coded responses presented here, though they were modified to be more specific to the country. Respondents could not say 'do not know' or refuse to answer the question.

ii - Answers in brackets are volunteered responses, and not read out by the interviewers.

These codes can be grouped together in the following ways as 'controlled' and 'uncontrolled' household disposalⁱⁱⁱ:

Controlled household disposal

Collection via:

- city garbage truck/government
- community group
- private company

Uncontrolled household disposal

Someone from the household:

- burns it
- throws it outside
- takes it to the tip

Notably, these answer codes do not explicitly account for the informal sector, a large and significant labour force globally³³. Informal waste workers have roles spanning waste collection, sorting and processing. They are mostly found in lower-middle- and low-income countries where the economic incentive to work in such roles is high because levels of government waste management infrastructure are low³⁴.

These different forms of waste disposal have different levels of harmfulness. In general, open burning and dumping of waste are the most harmful forms of disposal, with landfill and basic open-burning incinerators (which have some air pollution control) slightly less so. Controlled, engineered landfill is less harmful still³⁵. The chance of waste ending up in less harmful destinations is higher when a government or other organisation officially collects waste. However, because of how this question was asked and coded, we cannot know how much household waste that is collected ends up in controlled landfills as opposed to other places like dumpsites or burning, which have more negative consequences for public and environmental health. That said, the presence of household waste collection itself signifies more established and widespread waste infrastructure, as opposed to countries and regions where uncontrolled burning and dumping are high. From an analytical perspective, this report considers the three methods that comprise 'controlled disposal' as more sustainable than the three that comprise 'uncontrolled disposal'.

iii - For analytical purposes, we have classified any collection methods (government, private company, community group) as 'controlled' disposal, and anything that is not collected as 'uncontrolled'. The groupings differ slightly from those used by the World Bank in their *What a Waste 2.0* report. The groupings are necessarily broad and because the data were collected via open-ended questions (the responses were then pre-coded), we cannot be sure that any waste that was not collected (e.g., taken to the tip) was disposed of in a controlled facility. While we also cannot be sure that collected waste (e.g., via government, private company or community group) is ultimately disposed of in a controlled facility, organised collection is seen as the most desirable and sustainable form of household disposal globally and is therefore classified as 'controlled' in this report.

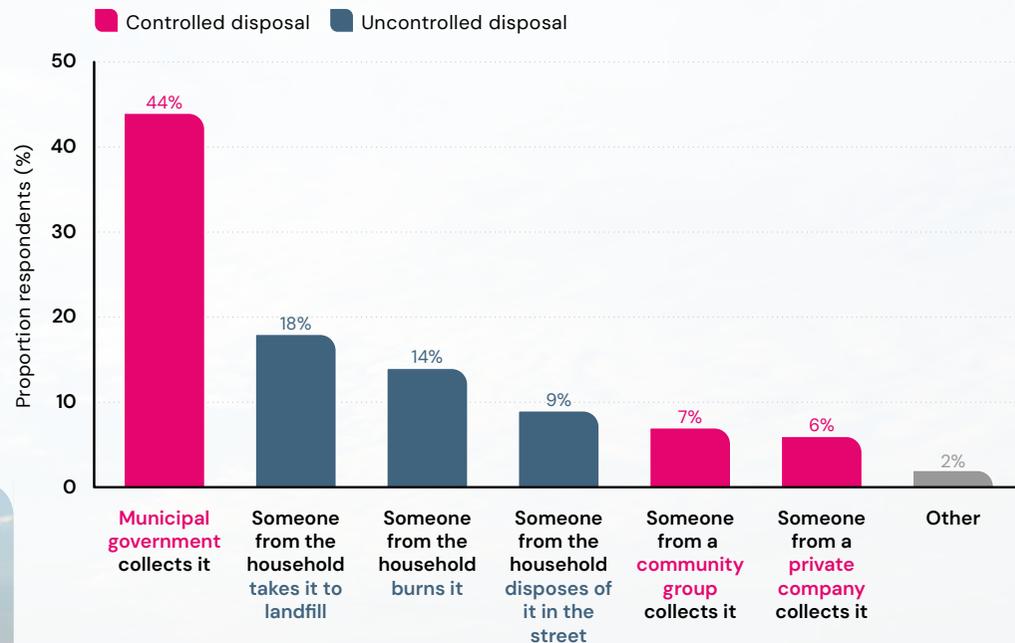
Globally, collection by a municipal or local government (usually with a truck) is the most commonly reported method of collecting household wasteⁱ. Forty-four percent of global households dispose of their waste in this way – more than twice as many as the next most common method of disposal: a household member taking it to the trash/landfill (which is not necessarily always a harmful or negative action, and its harmfulness can vary depending on the context and country). Fourteen percent of households burn their waste, with a further 9% dumping it outside the home. In total, 41% of households report disposing of their waste in an uncontrolled manner, either by taking it to a landfill, burning it or dumping it outside their houseⁱⁱ, as opposed to over half (56%) that report controlled disposal.

Other forms of official collection, whether via a community group or private company, are the least common modes of disposal globally.

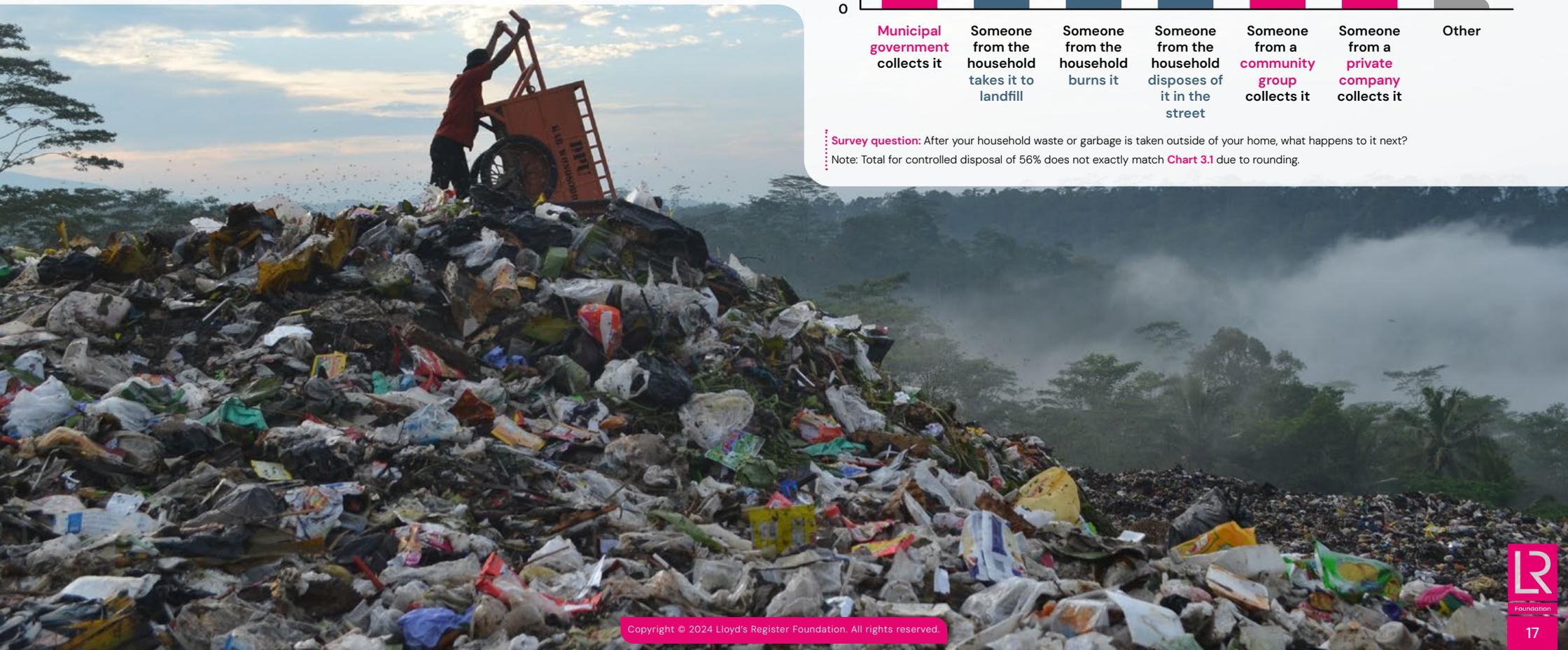
ⁱ – Henceforth, this will be referred to as 'government collection' for simplicity.

ⁱⁱ – In total, 41% of households dispose of their waste in an uncontrolled manner, either by taking it to a landfill, burning it or dumping it outside their house. This figure for uncontrolled disposal measures a slightly different phenomenon in a different way than the UNEP *Global Waste Management Outlook* report, but the two are closely matched. According to the UNEP *Global Waste Management Outlook*, 38% of all municipal solid waste generated in 2020 was uncontrolled.

Chart 4.1. Global household waste disposal methods, controlled and uncontrolled disposal



Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?
 Note: Total for controlled disposal of 56% does not exactly match [Chart 3.1](#) due to rounding.



While formal household collection is the most sustainable form of waste management, open burning is among the least. The existence of the former is a necessary precursor to minimise the latter, but many lower-income countries lack sufficient funds to operate an efficient collection method — a significant barrier to reducing burning, which is primarily conducted to reduce the volume and mass of waste³⁶. Open burning of household waste is an informal activity, often conducted by people outside their homes. When household waste is burned, there is no record of its existence, meaning that its impact on public and environmental health is also likely underestimated³⁷.

These impacts on human and environmental health are significant, particularly as populations — and the heterogeneity of their waste mix — increase. Open burning of waste releases black carbon into the atmosphere, a key driver of global warming³⁸. In addition to black carbon, open burning also releases unintentional persistent organic pollutants³⁹, otherwise known as ‘forever chemicals’ that endure in the atmosphere, can be carried long distances and harm public health by entering food chains⁴⁰ and causing respiratory and neurological diseases⁴¹. Research suggests that up to 1 million people die each year in lower-income countries from diseases related to mismanaged waste, of which open burning is a core part⁴². Open burning is a risk to public safety in many other ways, including accidental fires and soil and water contamination, leading to agricultural and environmental losses and related costs to governments.

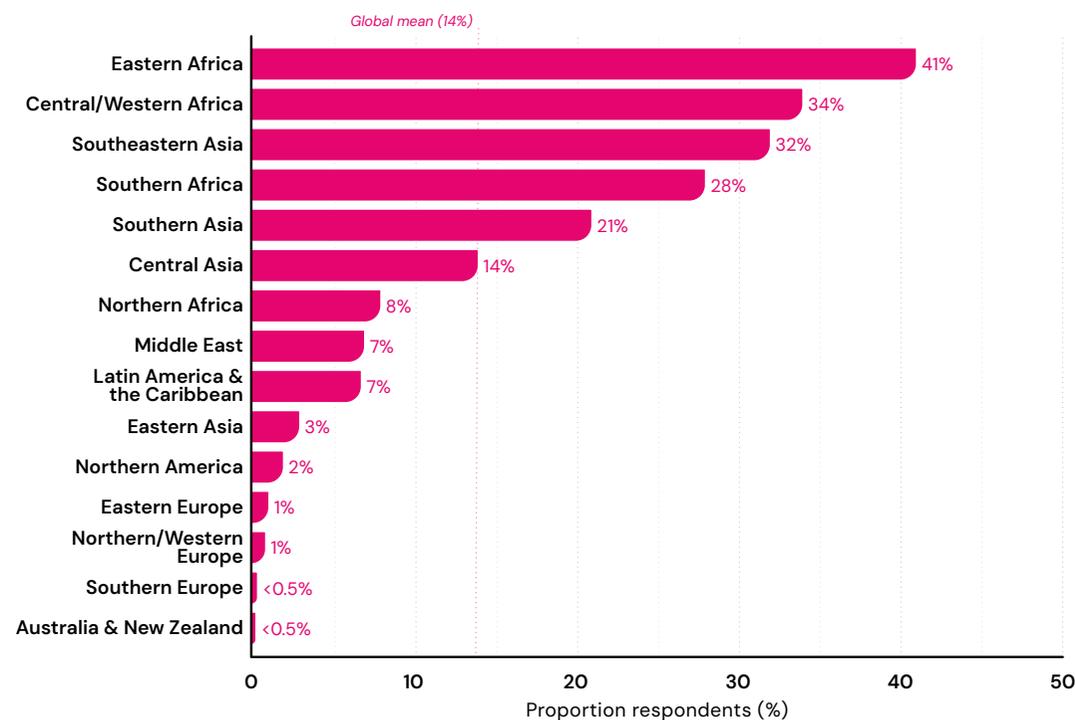
Some global structures are already in place to tackle the problem of open burning. The Stockholm Convention regulates several forever chemicals, including dioxins and furans, of which open burning in low-income countries is the biggest contributor⁴³. Environment ministers from across Africa also convened at the African Ministerial Conference on the Environment in 2022 to commit to eliminating the open burning of waste⁴⁴.

Open burning of household waste is illegal in many countries. As such, the historical prevalence of open waste burning is likely underestimated due to a lack of data⁴⁵. Unlike the UNEP *Global Waste Management Outlook* or the World Bank’s *What a Waste 2.0* reports, which account for burning in statistics on ‘uncontrolled disposal’ and ‘open dumping’ respectively, the World Risk Poll is unique in its ability to produce a global estimate of the percentage of individuals living in households that report open burning of their waste.

This figure is 14%, equivalent to one in seven households globally, making open burning the third most common method of household waste disposal behind government collection (44%) and a household member taking the waste to a dump (18%).

Beneath this global figure, different regions see very different rates of open burning. People in low- (37%) and lower-middle-income (22%) countries are much more likely to live in households that report burning their waste than in upper-middle- (9%) and high-income (1%) countries. Regions like Eastern (41%) and Central/Western Africa (34%) see more than a third of households open burning their waste, compared to 1% or less across Europe, Australia and New Zealand.

Chart 4.2. Percentage of households whose primary method of waste disposal is open burning, by region

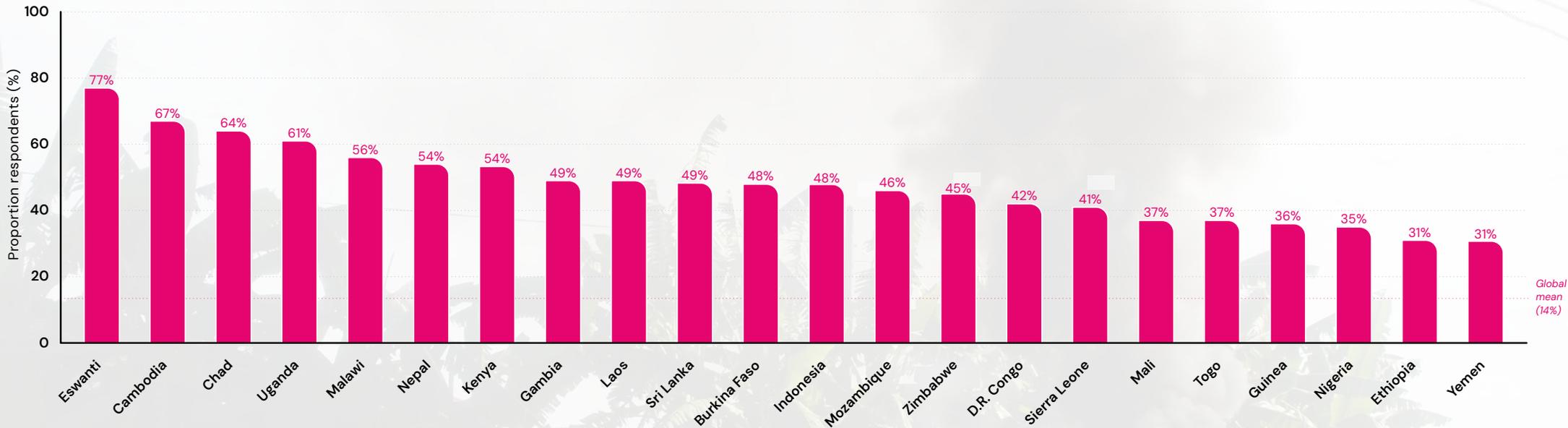


Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

ⁱ - This illegality could, in some cases, make survey respondents more hesitant to admit open burning. This is a notable caveat when considering national and global rates of burning, which likely exclude some people who do burn their waste but do not admit this to an interviewer.

A majority of individuals in seven countries live in households that burn their waste (see **Chart 4.3**), but there are 22 countries overall where open burning is the most common form of disposal nationally. All but one of these 22 countries (Yemen)ⁱ are located in Africa or Asia.

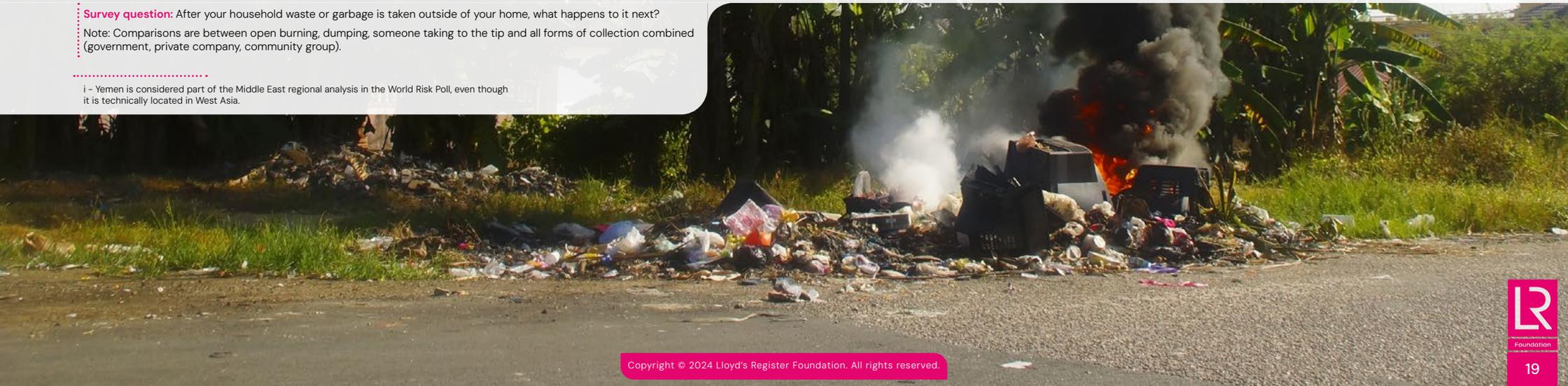
Chart 4.3. Countries where open burning is the most common form of household waste disposal



Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

Note: Comparisons are between open burning, dumping, someone taking to the tip and all forms of collection combined (government, private company, community group).

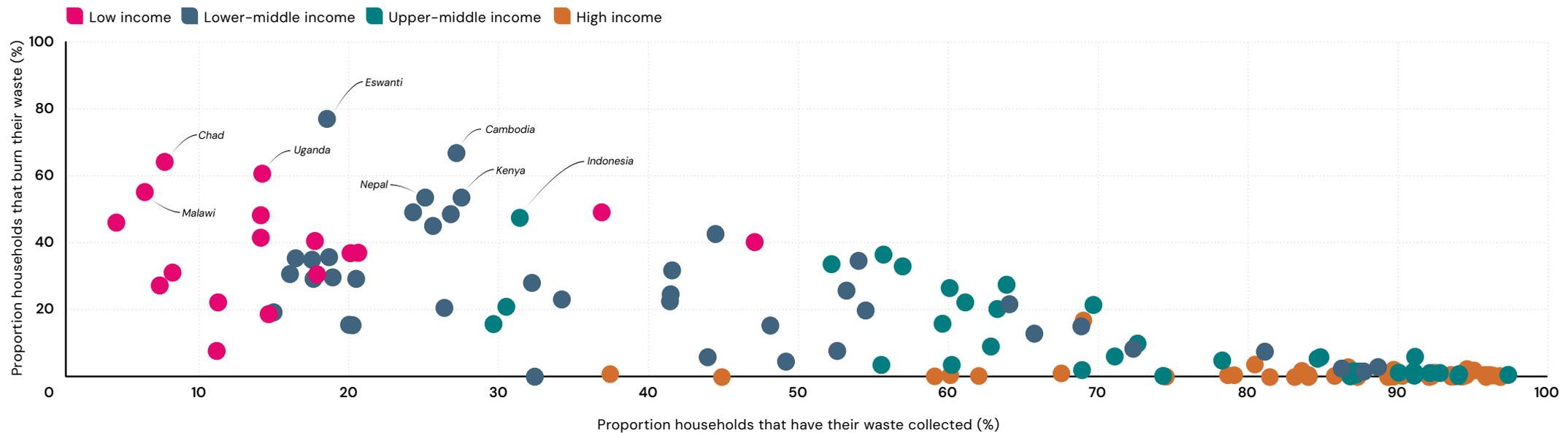
ⁱ - Yemen is considered part of the Middle East regional analysis in the World Risk Poll, even though it is technically located in West Asia.



At a national level, the link between an absence of collection and the prevalence of burning is clear. There is a robust negative correlationⁱ between countries in terms of their collection rates and open burning, as shown in **Chart 4.4**. The more prevalent household collection is, the less household waste is burned. While this correlation does not, on its own, imply causality, it does support the hypothesis proposed by many experts, including the UNEP, that household collection is a crucial factor in preventing open burning. Transitioning away from open burning towards collected waste that ends up in controlled landfill sites should be the ultimate goal for countries where burning rates are currently high. Proper infrastructure and management practices, therefore, are desperately needed to mitigate the negative outcomes of unsustainable waste disposal.

Eswatini has the highest rate of open burning in the world by a considerable margin (77% of households). This finding supports existing research in Eswatini⁴⁶ that found high rates of open burning were driven by the lack of alternatives for disposing of waste. Open burning in Eswatini, like other countries, was also found to include a range of materials, with plastics being burned readily alongside paper. Eswatini also features in the top 10 countries for highest reported rates of plastic as the primary material in household waste (see **Table 2.1**). With a population of just over a million people, Eswatini is one of the least populous countries in Africa. Its Nationally Determined Contributions (NDC)⁴⁷, submitted to the UN Framework Convention on Climate Change, mentions that decreasing open burning of municipal solid waste is a key measure that needs to be implemented to reduce greenhouse gas emissions (as well as protect the safety of the population).

Chart 4.4. Relationship between national waste collection rates and open burning, by World Bank country income level



Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

ⁱ - The Pearson correlation coefficient between these two data series is -0.79.

Work has already been initiated to address the issue, with the establishment of drop-off and buy-back stations in the capital, Mbabane. But in a country where most of the population lives in rural areas and three in four households continue to burn their waste, Eswatini has a long way to travel on the road to more sustainable and safe waste disposal practices.

Indonesia offers another stark example of the problem. The issue of burning waste in Indonesia has been known for years, with a 2019 study finding alarming levels of dioxins in the country's food chain, driven by burning plastic⁴⁸. Just under half (48%) of households in Indonesia continue to burn their waste⁴⁹ – one of the highest rates in the world, even though Indonesian law prohibits the activity. In reality, however, half of the country's households flout these regulations⁵⁰. As Indonesia demonstrates, banning the open burning of household waste is often ineffective on its own in the absence of providing people with viable alternatives.

Indonesia's waste management is globally significant for several reasons. Even though a smaller percentage of households in Indonesia burn their waste than in Eswatini, the absolute number of these households in Indonesia dwarfs most other countries. Indonesia is the fourth most populous country in the world and the world's second-biggest producer of plastic waste. It is also the end destination for significant amounts of waste shipped overseas from other countries⁵¹. How Indonesia tackles its waste crisis in coming years will be of great significance to the country, the wider region and the global waste landscape.

Insight to action

This chapter demonstrates how the open burning of household waste remains a key issue in global waste management. It is an issue particularly concentrated in lower-income countries across Africa and Southern and Southeastern Asia. In these countries, people who burn their household waste often live and work near places where waste burning takes place. As a result, they are directly affected by the dangerous pollution produced by burning, which impacts air and water supply and contributes to serious respiratory illness and immune disorders⁵².

Even though the investment required to build effective waste collection systems is expensive, policymakers must weigh this cost against the public health and environmental costs of unofficial waste disposal, primarily in the form of open burning. Open burning has highly dangerous and detrimental effects on public and environmental health, as well as on socioeconomic inequity, more broadly. Despite the costs, this presents a clear economic rationale for prioritising waste management improvements. Minimising (and eradicating, where possible) open burning is a critical step in building safer, more sustainable waste practices as the volume of municipal waste continues to grow. If rates of open burning are to decline in the future, then controlled collection and disposal will be integral to this effort. It is to that topic that we now turn.



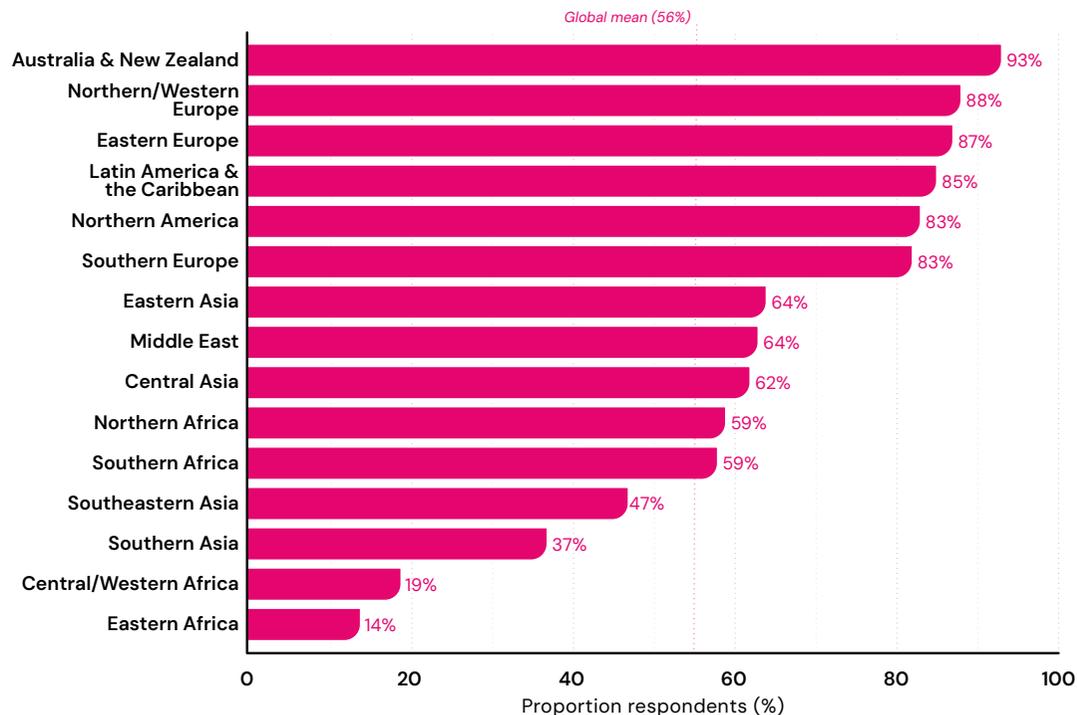
5. Controlled disposal: An urban-rural divide

A common theme throughout this report is how household waste practices vary significantly by region and country income level. This also holds for organised household collection. Globally, 56% of households have their waste collected in some form, mostly via the local/municipal government (44%). Waste collection is widespread across Australia and New Zealand, Northern America, Europe, and Latin America and the Caribbean. Eastern Asia, the Middle East, Central Asia, Northern Africa and Southern Africa all see relatively similar rates of collection (around three in five households).

Four regions stand out where a minority of households have their waste collected. Southeastern Asia (47%) and Southern Asia (37%) are far less likely than Eastern (64%) and Central (62%) Asia to have their waste collected. But Central/Western (19%) and Eastern (14%) Africa score significantly lower than the rest of the world for waste collection.



Chart 5.1. Percentage of households that have their waste collected, by region



Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

Official waste collection is widespread in high-income countries (86%) but close to non-existent in low-income countries (11%). Country-level differences — in terms of global location and income level — only tell part of the story of household waste collection. Clearly, a household's likelihood of having their waste collected is closely related to which country it is located in. However, waste collection is also closely related to where a household is situated in a country.

In high-income countries, urbanicity plays a limited role in the distribution of waste collection, which is slightly more likely in cities (88%) than in towns and semi-dense areas (86%) or rural areas (81%). Nearly all households in high-income countries like Austria and Denmark have their waste collected, regardless of how urban or rural their areas areⁱⁱ.

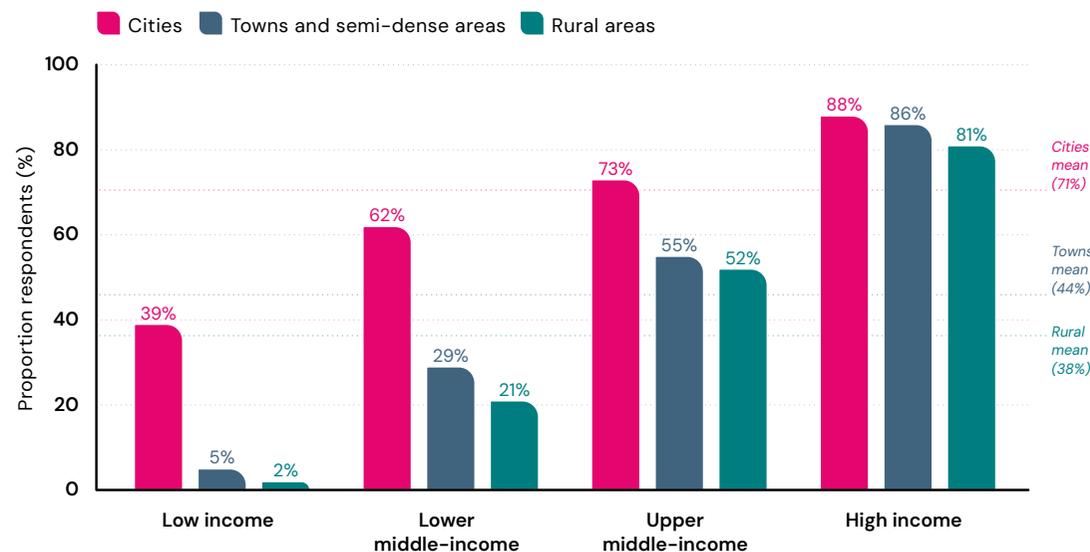
As country income level decreases, however, the effect of urbanicity becomes more pronounced. In upper-middle-income countries, just under three in four households in cities (73%) have their waste collected. This figure drops to just over half of households in towns and rural areas (55% and 52%, respectively).

In lower-middle-income countries, a majority (62%) of city households have their waste collected, but the urbanicity effect is more significant than in upper-middle-income countries. Only 29% of households in towns and 21% in rural areas have their waste collected.

Low-income countries exhibit the sharpest differences in waste collection by urbanicity. Not only is the 39% collection rate in cities significantly lower than in wealthier countries, but waste collection is almost non-existent outside cities. Just 5% of households in towns have their waste collected, dropping to 2% in rural areas.

ⁱ - In upper-middle-income countries, 65% of households have their waste collected. This percentage falls to 40% in lower-middle-income countries.
ⁱⁱ - Austria — cities: 94%; towns: 96%; rural areas: 95%. Denmark — cities: 93%; towns: 96%; rural areas: 96%.

Chart 5.2. Global household waste collection rates, by degree of urbanisation and World Bank country income level

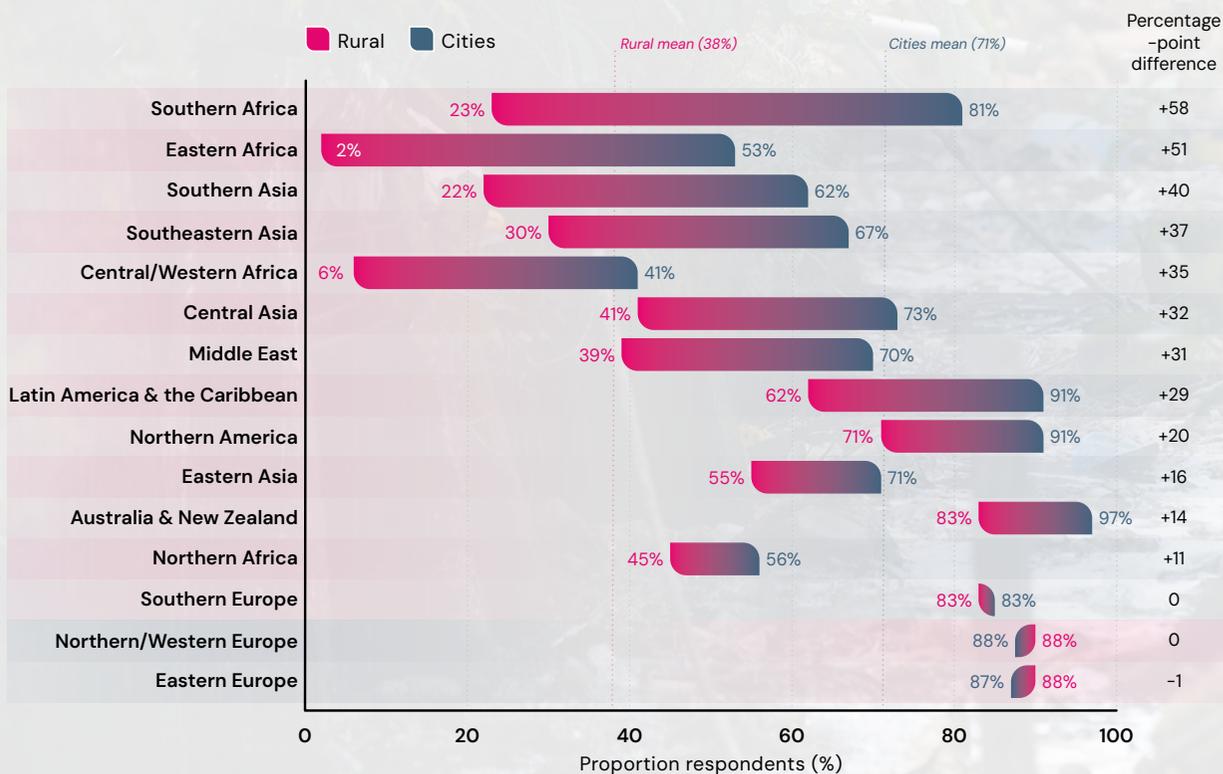


Managing household waste is a costly exercise. Collecting waste is the most expensive element of the municipal waste management chain. A crew must be paid, and collection vehicles need to be maintained, fuelled and insured⁵³. This high cost helps explain why collection rates are so low in rural areas of low-income countries, where burning or dumping waste comes at virtually no financial cost to households.



Analysing household waste collection by global region also highlights hotspots for policymakers to focus on. As shown in **Chart 5.3**, Europe has no disparity in collection between cities and rural areas. Across the continent, between 80% and 90% of households in cities and rural areas alike have their waste collected. The slight urban skew in waste collection among high-income countries is driven by Australia and New Zealand (with a 14-percentage-point gap) and Northern America (a 20-percentage-point gap). The urban-rural divide in waste collection is widest across Africa and large parts of Asia. In Southern and Eastern Africa, the gap between cities and rural areas is more than 50 percentage points.

Chart 5.3. Household waste collection rates, by degree of urbanisation and global region



Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?
 Due to rounding, percentage-point differences may total +/-1 percentage-point.



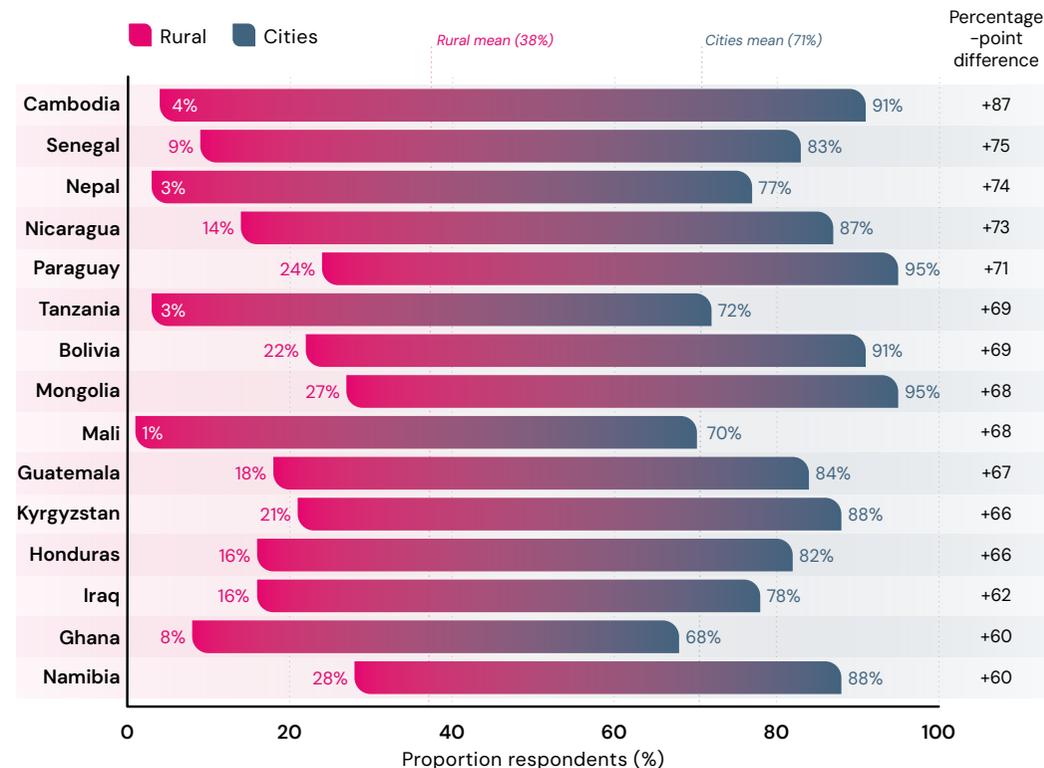
Rural household waste collection is virtually non-existent in many African countries, including the Democratic Republic of the Congo, Uganda, Liberia, Mozambique, Zimbabwe and Mali.

In addition to analysing countries with the absolute lowest values for rural waste collection, it is also instructive to look at countries with the greatest disparity in waste collection, even if they do not have the lowest overall rates. **Chart 5.4** shows the 15 countries with gaps in waste collection of 60 percentage points or more between cities and rural areas — the two extremes of the degree of urbanisation scale. Many of these countries see high levels of collection in cities, with little to no collection in rural areas.

As such, closing the urban-rural divide will require highly localised strategies depending on the country in question: some countries need to be hyper-focussed on boosting collection in rural areas, while others need to take a broader approach to increase collection in in all areas.



Chart 5.4. Top 15 countries with the largest gaps between cities and rural areas in organised waste collection



Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?
 Due to rounding, percentage-point differences may total +/-1 percentage-point.

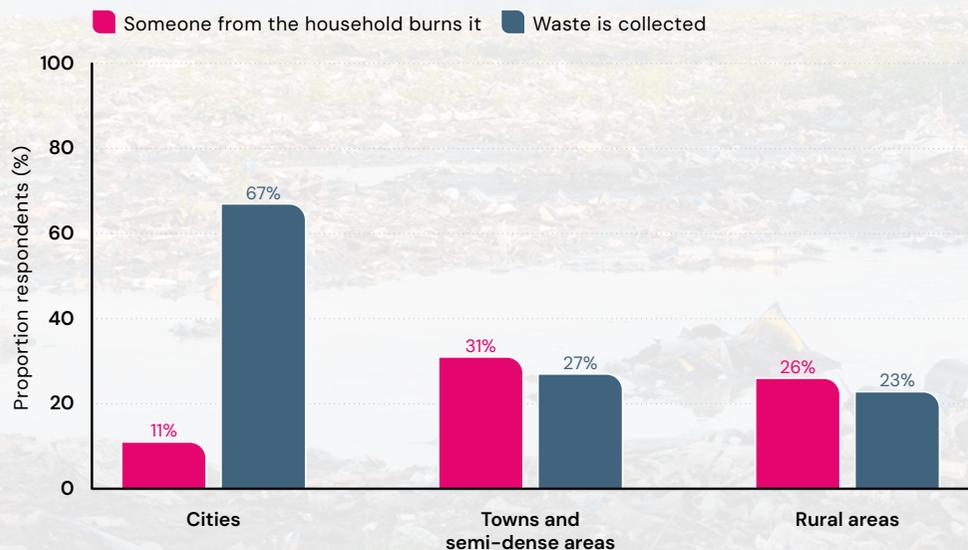
Focus on India: Regional waste disparities

India recently overtook China as the most populous country in the world. It is also the world's fastest-growing major economy⁵⁴. As India's population and per capita income have grown, so too have the volume and compositional diversity of its household waste⁵⁵. Therefore, in sheer volume terms, how India disposes of its waste is of immense importance to the inter-linked crises of climate, biodiversity loss and waste.

Data from the World Risk Poll show that disposal methods vary significantly based on a respondent's location. In cities, 67% of households report that their waste is collected for disposal, while 11% report personally burning it. This relatively high level of collection collapses to 27% in towns and semi-dense urban areas and 23% in rural areas. Concerningly, this reduction in collection is associated with an increase in open burning of waste. Twenty-six percent of households in rural areas say they burn their household waste, rising to 31% in towns and semi-dense urban areas.

Open burning is known to be a significant source of particulate matter with potentially serious impacts on human health. That it is occurring to such a high degree in population dense areas is a major concern.

Chart 5.5. Indian household waste collection rates and open burning, by degree of urbanisation

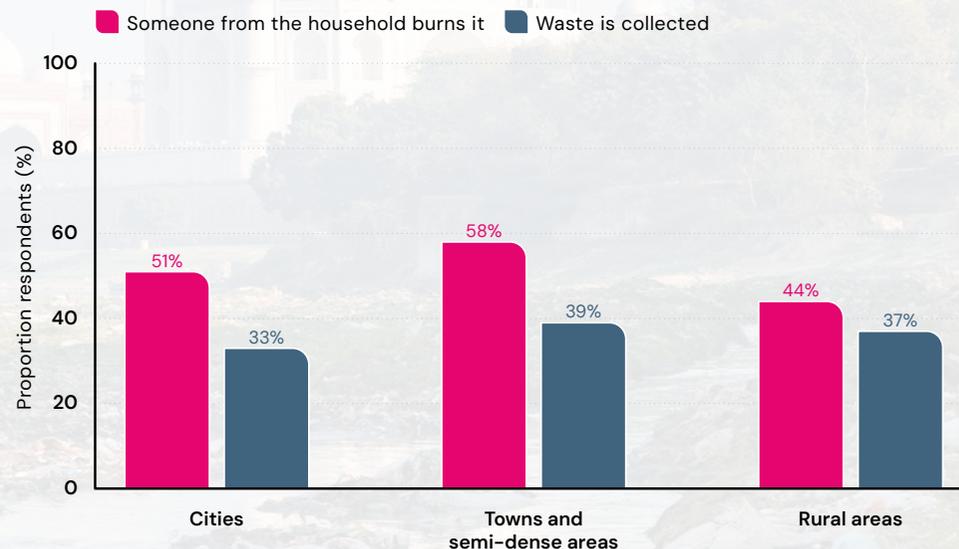


Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

Strikingly, households that burn their waste are also much more likely to cite plastic as their main form of household waste. While any prolonged exposure to airborne particulate matter can impact human health, burning plastics is known to release dioxins and polycyclic aromatic hydrocarbons other compounds that have been shown to have severe adverse health effects.

However, this does also suggest a potential intermediate step in adjusting waste management. While the ultimate goal should be to halt open burning by providing alternative controlled disposal methods, encouraging the 41% of Indian households that burn their waste but do not separate it to split and dispose of their plastic waste through alternative means could have a significant positive environmental and health impact.

Chart 5.6. Indian household waste collection rates and open burning, where plastic is the main form of waste, by degree of urbanisation

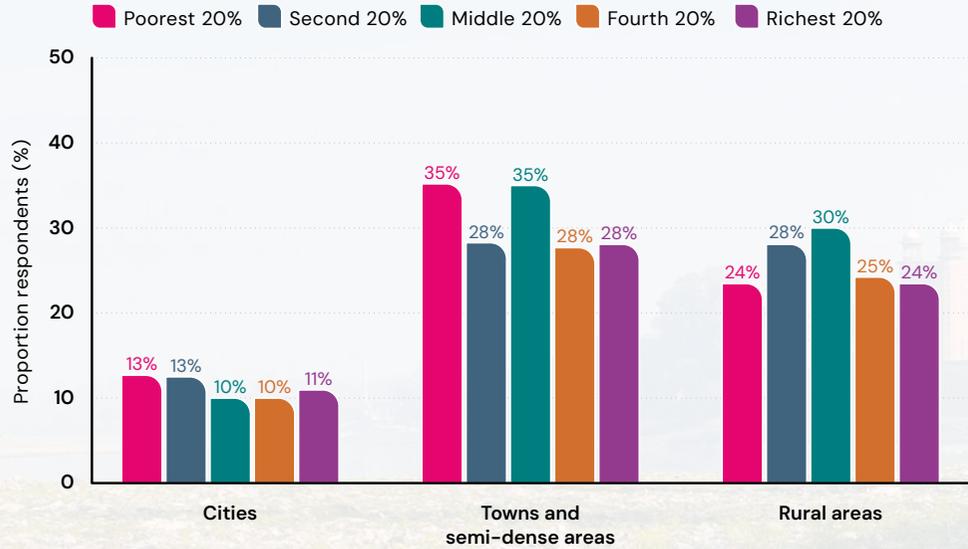


Survey questions: After your household waste or garbage is taken outside of your home, what happens to it next? Please think about your household waste and garbage, including recyclables. What would you say is THE ONE most common type of material in your household waste? For example, is it plastic, food waste, or something else?



Of particular interest is that the proportion of open burning is consistent across income groups. This finding suggests that rather than disposal services not being provided equally, they may not be provided all in certain regions. Any approach to deliver services should, therefore, focus on being equitable to all income groups to avoid creating disparities seen in other countries and global regions.

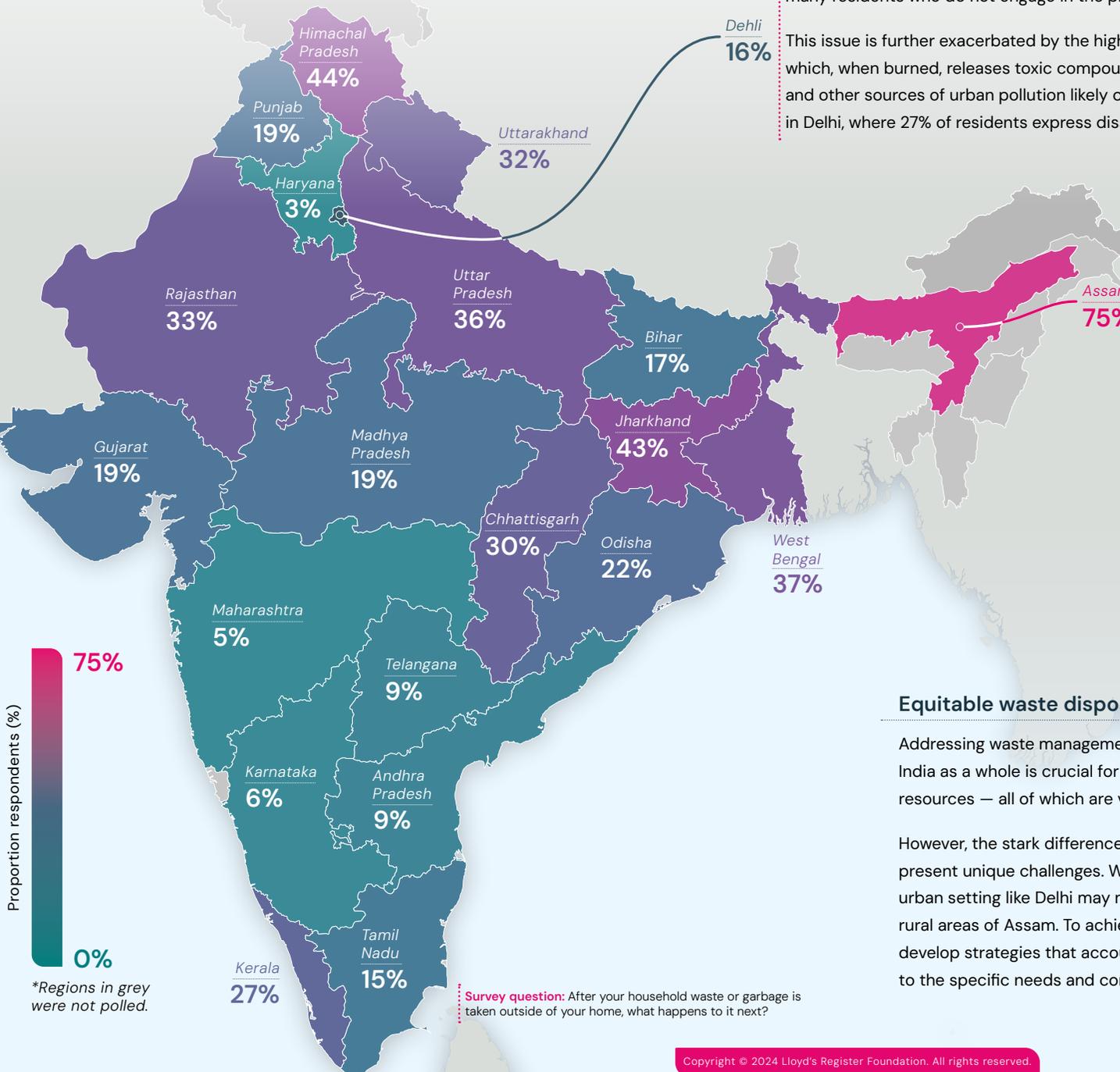
Chart 5.7. Indian household waste open burning, by income quintile and degree of urbanisation



Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?



Chart 5.8. Indian household waste open burning, by region



Open burning in Delhi, reported by 16% of households, remains a significant concern despite being lower than in other regions. In a dense urban area like Delhi, even limited open burning has a widespread impact, affecting many residents who do not engage in the practice, as harmful pollutants disperse throughout the city.

This issue is further exacerbated by the high proportion of households that primarily generate plastic waste, which, when burned, releases toxic compounds into the air. The combination of pollutants from open burning and other sources of urban pollution likely contributes to the relatively low levels of satisfaction with air quality in Delhi, where 27% of residents express dissatisfaction, compared to an average of 15% across the rest of India.

Assam has the highest levels of open burning in India, with 75% of households relying on it as their primary means of waste disposal. The state's remote location in the foothills of the Himalayas, characterized by rivers, forests and hilly terrain, makes establishing and maintaining waste management facilities particularly challenging, especially in isolated and flood-prone areas.

Heavy monsoon rains and frequent flooding exacerbate these issues by disrupting waste collection and dispersing waste, leading to the contamination of water sources and agricultural land. Limited financial resources and logistical difficulties further hinder the development of effective waste management solutions, leaving many households with few options beyond open burning or improper dumping.

Equitable waste disposal requires regional context

Addressing waste management, particularly the issue of open burning, in Delhi, Assam, and across India as a whole is crucial for protecting public health, ensuring safety and preserving natural resources — all of which are vital for sustainable development⁵⁶.

However, the stark differences in geography and population density between these regions present unique challenges. Waste disposal methods that are effective in a densely populated urban setting like Delhi may not be suitable for the sparsely populated, geographically challenging rural areas of Assam. To achieve truly equitable waste disposal across India, it is essential to develop strategies that account for these regional differences, ensuring that solutions are tailored to the specific needs and constraints of each area.

Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

Proportion respondents (%)



*Regions in grey were not polled.

Focus on Brazil: Open burning in river deltas

Brazil makes an interesting counterpoint to India when looking at household waste disposal, as both nations grapple with similar economic challenges and geographic diversity at a continental scale but differ significantly in outcomes.

For example, in Brazil there are almost zero households in urban areas of any density that say they burn their waste (less than 0.5% in each), with the vast majority saying their waste is collected. However, more than a third (36%) of rural households burn their waste. This suggests more mature waste management processes are in place across urban Brazil, but these need to be extended into rural regions.

Chart 5.9. Brazilian household waste collection rates and open burning, by degree of urbanisation

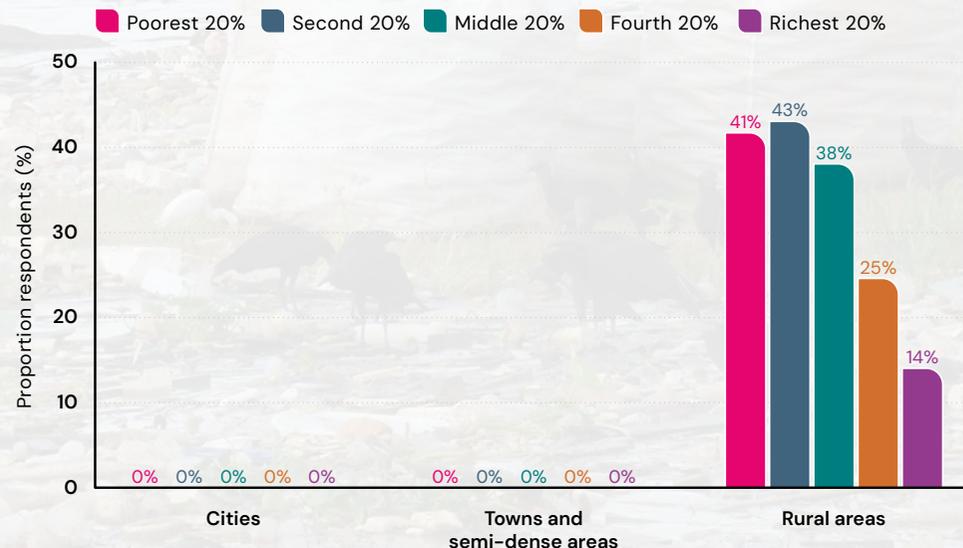


Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

Unlike in India, however, waste disposal in rural areas is not equal among income groups. While 42% of the poorest households burn their waste in rural areas, this figure drops to 14% for the richest households.

Notably, this difference is not driven by wealthier households paying for private waste collection; a majority of households in the richest 20% receive government waste disposal services. Expanding existing services to support poorer households in rural areas could be an impactful step in reducing open burning.

Chart 5.10. Brazilian household waste open burning, by income quintile and degree of urbanisation



Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

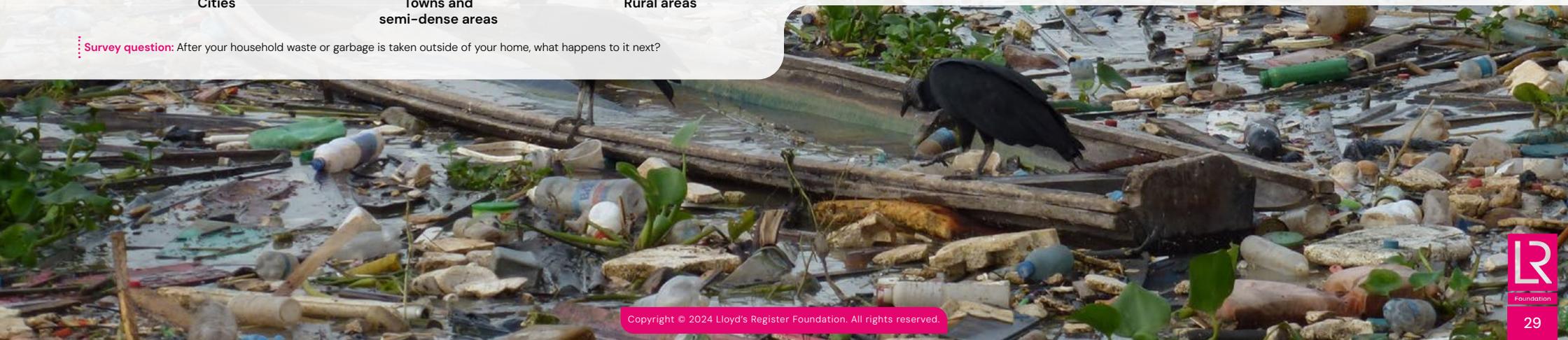
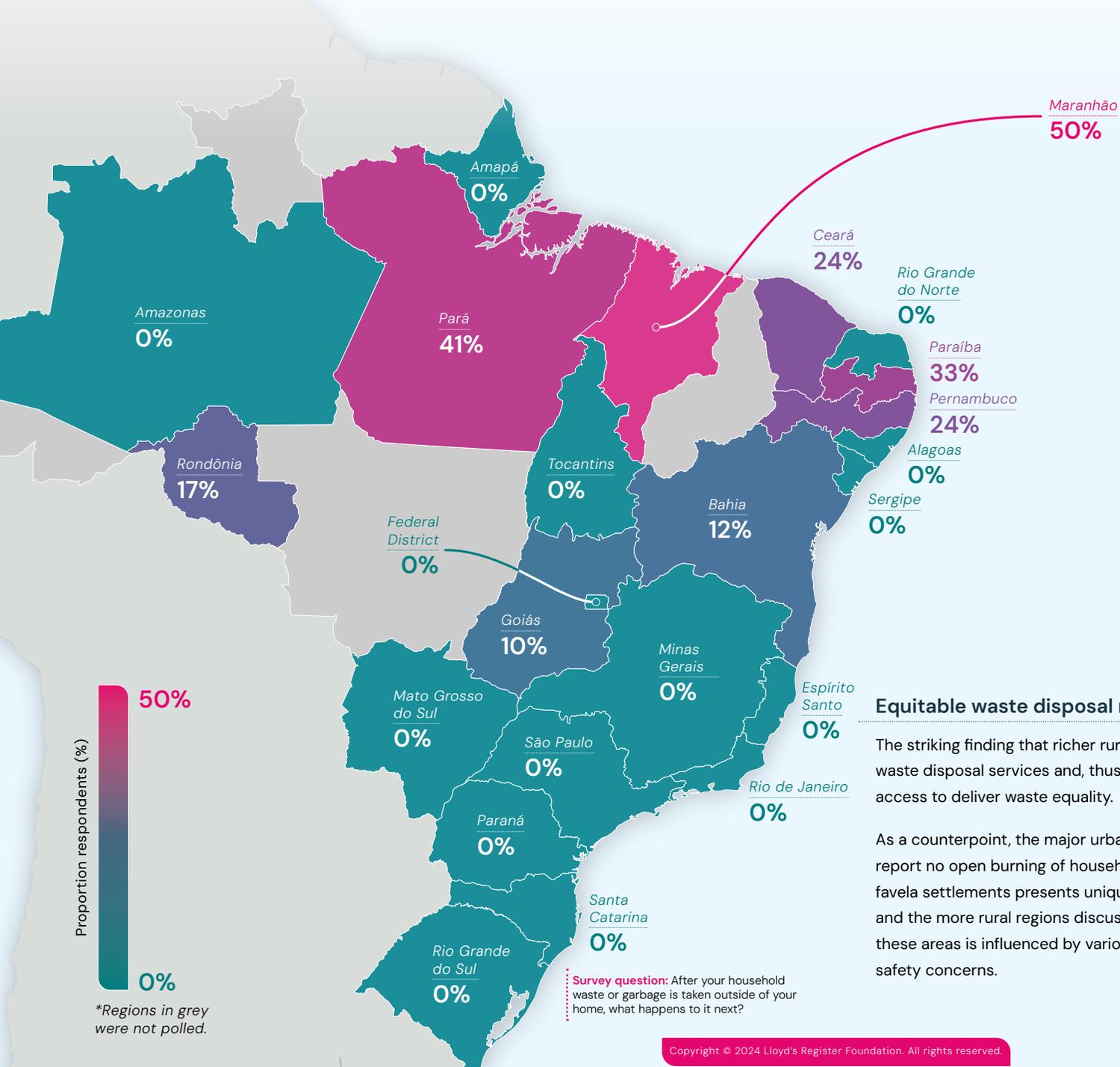


Chart 5.11. Brazilian household waste open burning, by region



*Regions in grey were not polled.

Survey question: After your household waste or garbage is taken outside of your home, what happens to it next?

In Brazil, high levels of open burning are observed in rural areas around the Amazon delta, with half (50%) of the households in the state of Maranhão reporting that they burn their waste. The neighbouring state of Pará, which also features extensive forests and river systems, exhibits similar practices, with 41% of households disposing of their waste through open burning.

Both regions face similar issues with infrastructure to those faced by the government and community groups in Assam, India, where waste management issues are exacerbated by geography and population distribution. However, the absence of open burning in the state of Amazonas indicates that effective solutions are possible in such remote and rural regions. Examining and sharing the successful waste management policies and programs implemented in Amazonas could provide valuable insights and improve waste management practices in other geographically similar regions worldwide.

Equitable waste disposal regardless of income

The striking finding that richer rural households in Brazil are more likely to receive government waste disposal services and, thus, be less likely to open burn demonstrates the need to expand access to deliver waste equality.

As a counterpoint, the major urban areas of southeastern Brazil, Rio de Janeiro and São Paulo, report no open burning of household waste. However, urban waste management in the informal favela settlements presents unique challenges that differ significantly from other urban regions and the more rural regions discussed above. The irregular and inconsistent waste collection in these areas is influenced by various factors, including geographical layout, accessibility and safety concerns.

Insight to action

While controlled collection of household waste is costly for local or municipal authorities to implement on a regular basis, the costs to human health, the environment and longer-term sustainable development of not implementing controlled collection are far higher and pose more difficult developmental and health challenges⁵⁷. As the World Bank notes in *What a Waste 2.0*⁵⁸:

“Adequate waste services are more difficult to achieve in low- and middle-income countries, where challenges are as much a result of poor planning and service operation as a lack of funding for investments. Daily waste management is expensive; requires institutional skills for planning, operational management, and oversight; and, where funding is limited, waste management competes with other development priorities. Developing waste management capacity and mobilizing resources requires strong political support.”

Indeed, the last point — political will — is of great importance.

However challenging, progress can be made in lower-income countries in raising collection rates and safer waste management. Efforts should be underpinned by long-term political commitments and accountability, collaboration with donors, addressing stakeholder incentives, openness to varied financial models, uptake of simple, cheap technologies, and staff capacity building⁵⁹. Community waste management models can also be introduced to good effect in rural areas of low-income countries where no adequate waste management infrastructure exists. Such models should emphasise the resource value of household waste through education.

When people come to realise the value contained in waste, self-employed recycling entrepreneurs can at once provide a service to the public and environmental health of their community while creating more sustainable livelihoods for themselves⁶⁰. Additionally, bringing informal ‘waste pickers’ into official waste management systems through policy interventions⁶¹ is likely to improve their working conditions and reduce the risks of working in unhygienic, unsafe conditions⁶².

Several waste management administration, operation and financing models have been successfully adapted to the local context in lower- and middle-income countries⁶³, such as private-public partnership models. However, the success of such policies depends largely on affordability, regulatory structures, enforcement of legislation⁶⁴, infrastructure and community engagement, all of which need to be aligned to ensure household waste is collected and managed effectively and sustainably in rural and urban areas. In particular, the gap between waste collection in urban and rural areas could leave rural areas even more impoverished and disadvantaged than they already are in terms of lower incomes and poorer health outcomes⁶⁵, as a lack of controlled waste collection could lead to more dumping, open burning, and greater soil and water contamination. All of these would have more devastating health and economic consequences for rural populations.



6. Global household waste: Further analysis

So far, this report has focused on three questions in relative isolation: which materials are discarded, whether they are separated prior to disposal and what happens to them after they are thrown away. This final section steps back and analyses the global household waste landscape from a broader, integrated perspective.

Combining different waste variables asked in the World Risk Poll offers another lens through which to evaluate areas of strength, weakness and opportunity in global waste management. For example, combining questions on waste collection and separation allows us to group respondents into one of four categories based on how much work needs to be done in building more sustainable waste practices.

Chart 6.1. Percentage of households per waste behaviour quadrant, by World Bank country income level



A third (33%) of global households report separating their waste before disposal and having their waste collected (most commonly via the local government), making this the most common form of waste disposal globally (see [Chart 6.1](#)). Other forms of household waste management are relatively less common. Similar proportions of household waste are collected but not separated (23%), not collected but separated (20%) and neither collected nor separated (24%). Taken together, 43% of households either separate their waste or have it collected, but not both, and represent a significant opportunity to build more sustainable practices globally.

Households in high-income countries are overwhelmingly likely to separate their waste and have it collected (71%). However, in low-income countries, just 4% of households do the same, and the majority (61%) of households neither separate nor have their waste collected. In upper-middle-income countries, as many households have their waste collected and separated as have their waste collected without separating first (32% vs. 33%, respectively). Whereas in lower-middle-income countries, 26% of households separate their waste but do not have it collected — the second most common form of waste behaviour after neither separated nor collected (34%).

Countries with high rates of neither collecting nor separating their household waste have the longest way to go in delivering more sustainable waste practices. For example, the 61% of households in low-income countries that neither separate their waste nor have it collected face several barriers, primarily a lack of local government support and infrastructure (particularly in rural areas). Much work needs to be done to encourage and facilitate waste separation at the household level, as well as provide better infrastructure and collection services at the community and society levels. In many other countries, however, there are considerable areas of opportunity where one of two more sustainable behaviours (separation and collection) are in place but not both. In these countries, some desirable forms of waste management exist but require focussed policy attention to make the most of existing good practices.

i - For the purposes of this analysis, waste is considered as 'collected' if a respondent indicates that some entity or individual collected the rubbish, such as by a truck operated by the municipal government. Individuals who did not explicitly describe their household waste as being collected are classified in the 'not collected' category. Similarly, only individuals who affirmed their household waste is (regularly) separated are included in this group; all other responses, including 'sometimes', are placed in the 'not separated' camp.

Survey questions: After your household waste or garbage is taken outside of your home, what happens to it next? When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not?

Seven of the top 10 countries where ‘collected, not separated’ waste makes up the largest share of the national household waste mix are in Eastern Europe (see [Table 6.1](#)). The top five are all Eastern European countries, where more than two-thirds of all households have their waste collected but do not separate it first. There is a significant opportunity in these countries to make it easier for people to separate their waste at the source so more secondary benefits of increased recycling and reduced landfill can be realised.

Table 6.1. Top 10 countries with the highest percentage of households whose waste is collected but not separated

| Country | Percentage of households where waste is collected but not separated |
|--------------------|---|
| Kosovo | 81% |
| Montenegro | 76% |
| Bulgaria | 74% |
| Bosnia Herzegovina | 70% |
| Serbia | 68% |
| Kuwait | 66% |
| State of Palestine | 65% |
| North Macedonia | 60% |
| Georgia | 59% |
| Chile | 57% |

Survey questions: After your household waste or garbage is taken outside of your home, what happens to it next?
When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not?

Using Kosovo as an example, lack of knowledge, awareness and education among the general population have hampered progress toward more separation of household waste at the source⁶⁶. More educational and awareness programmes need to be delivered, bringing together government authorities with different community leaders and organisations to increase the prevalence of separating household waste at the source⁶⁷. Helping households separate their waste more easily and effectively in large parts of Eastern Europe would mean that more households would dispose of their waste in more sustainable (collected and separated) ways.

Several countries in Southern Asia have the opposite problem to Eastern Europe. Namely, households separate their waste before disposal, but the separated waste is not collected in an organised, controlled way. The three countries where the proportion of ‘not collected but separated’ household waste is largest are Sri Lanka (51%), Nepal (50%) and Bangladesh (42%). While slightly lower than its regional counterparts, India (30%) nevertheless has a significant portion of household waste that is separated but not collected – more than any other form of disposal.

Table 6.2. Top 10 countries with the highest percentage of households whose waste is separated but not collected

| Country | Percentage of households where waste is separated but not collected |
|------------|---|
| Sri Lanka | 51% |
| Nepal | 50% |
| Bangladesh | 42% |
| Malawi | 41% |
| Uganda | 40% |
| Tajikistan | 39% |
| Sweden | 37% |
| Cambodia | 37% |
| Kenya | 36% |
| Honduras | 35% |

Survey questions: After your household waste or garbage is taken outside of your home, what happens to it next?
When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not?

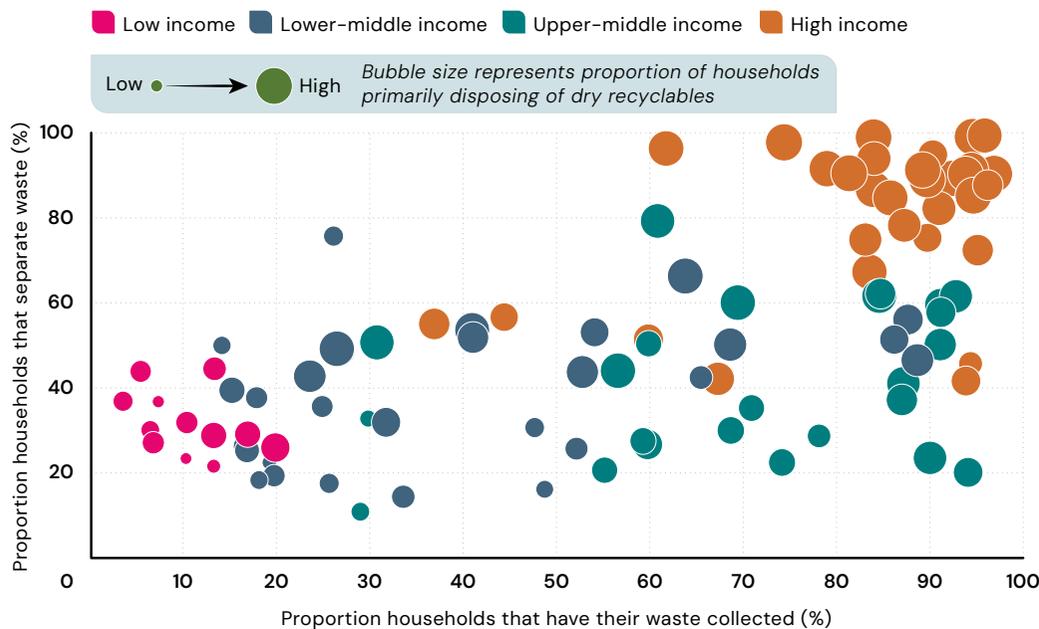
The question of what happens to separated, uncollected waste is important, and the answer varies considerably by country income level. Globally, 44% of household waste that is not collected but separated is taken by a household member directly to the dump, ahead of 34% which is burned. However, in low- and lower-middle-income countries, when waste is separated but not collected, it is more likely to be burned than disposed of in another way (53% and 44%, respectively). Governments investing in better waste collection systems would help capitalise on this existing separation, which is not being realised to its full, sustainable potential without effective collection (see ‘Insight to Action’ in Chapter Five).

Much of this report has displayed the degree to which household waste is determined by where a country is in the world and how affluent it is. Plotting all three World Risk Poll waste questions together — materials, separation and collection (see **Chart 6.2**) — demonstrates how varied the global landscape of household waste is. At the top right of the chart are predominantly high-income countries where most household waste is collected, separated and consists of dry recyclables. In theory, this area of the chart represents a more sustainable form of household waste than that which is not separated or collected.

Upper- and lower-middle-income countries have the most varied waste practices and differ more by collection than separation rates. Low-income countries are clustered at the bottom left of the chart, where the majority of household waste is not collected, not separated and contains relatively more food and green waste.

Low-income countries are the only ones with a negative relationship between separation and collection. In other words, in low-income countries, the more households separate their waste, the less likely they are to have it collected (and vice versa). Building towards safer, more sustainable waste management in the future will need to reverse this relationship and ensure that higher rates of separation and collection go hand in hand.

Chart 6.2. Relationship between proportions of household waste mix that is collected, separated and comprised of dry recyclables, by World Bank country income level



Survey questions: After your household waste or garbage is taken outside of your home, what happens to it next?
When your household waste or garbage is disposed of by someone in your household, is it SEPARATED in any way, or not?

i – Although not fully sustainable, as collected waste can still sit in a landfill and dry recyclables are not always actually recycled, even though they can be

Insight to action

Chart 6.2 shows how far the world — and lower-income countries in particular — has to travel towards more sustainable and safer waste practices. Significant parts of the world do not separate their waste or have it officially collected, contributing in different ways to significant harms to public and environmental health. Integrated solid waste management takes a strategic approach to managing waste in a more sustainable way. Governments and policymakers must consider the landscape of household waste in its entirety, from generation to separation, transfer to sorting and recovery to disposal⁶⁸.

As the findings from this report demonstrate, improvements in the three principles of ‘reduce, reuse, recycle’ should be at the heart of any integrated solid waste management solutionⁱ. They fit within the broader UN mission of the Zero Waste Initiative, which seeks to move the world towards circular economy principles where economic growth is decoupled from waste generation. For this initiative to make progress, careful planning, collective action and new regulations⁶⁹ are required, as well as fostering international collaboration to transfer best practices between countries.



ii – Gambia offers a useful case study of implementing an integrated approach to waste management. The country has historically suffered from inadequate waste infrastructure at the national level. Where organised collection does exist, it often uses inappropriate technology that is too expensive, meaning the poor are unable to afford it. In response, the UN Climate Technology Centre and Network implemented community-level training on technologies and strategies for recycling non-biodegradable materials, as well as specific training for women on producing charcoal briquettes out of dried leaves, dust and coconut shells. Such training sessions can help address all principles of an integrated approach, including reducing, reusing and recycling. See more here: *Improving capacity for recycling of waste & organic materials*. (n.d.). UN Climate Technology Centre & Network. <https://www.ctc-n.org/technical-assistance/projects/improving-capacity-recycling-waste-organic-materials>

7. Conclusion

This World Risk Poll report offers the first globally comparable analysis of public perceptions and self-reported experiences regarding household waste. In this sense, it is a valuable resource to be used in conjunction with other global analyses of waste volume and composition, as it gives the perspectives of people around the world on how they experience — and think about — what they throw away. It helps amplify the voices of people not often heard when looking at risk management and safe disposal of household waste worldwide.

Many findings in the report are striking. One in seven households globally burn their waste. Only one in 50 households in rural areas of low-income countries has their household waste collected. Two in five households globally do not separate their waste before disposing of it. Taken together, these and other findings in this report demonstrate, among others, two key points.

First, household waste practices vary significantly across regions, countries and income levels, and even people who live within the same households can view household waste practices differently. Second, and perhaps most importantly, this report draws attention to the variety of policy interventions needed to achieve global integrated waste management.

Ultimately, managing household waste in more sustainable ways will require systemic change that prioritises circularity over treatment and disposal. Change needs to come in many forms, be they attitudinal across governments, the private sector and the general public; institutional, in introducing regulation that promotes re-use and circularity and regulates the waste collection and disposal sector; infrastructural, in enhancing systems to reduce the personal health and environmental and climate impacts of hazardous disposal; or operational, in expanding training and technical skills needed to implement integrated waste management⁷⁰. These interventions will differ across the world, depending on the local context in each country and community. Ultimately, we hope the new data in this report highlight major challenges in household waste and help policymakers, communities and other organisations target interventions that will have the most impact on creating a more sustainable, safer future.

“This World Risk Poll report offers the first globally comparable analysis of public perceptions and self-reported experiences regarding household waste.”

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