

WoMena's SUMMARY AND RECOMMENDATIONS¹

Which, and how many, products are used? This FAQ focuses on disposable or reusable products, which are commercially available. Little information is available on traditional or homemade products. Estimates of how many products are used differ widely. Some estimates from High-Income Countries indicate around 30 products per cycle (390 annually), resulting in 200 kg of waste in a lifetime of use; estimates from Low-Income Countries are lower - some at 10 products per cycle (130 annually). Commercial sector estimates indicate that this is a large market in rapid growth: globally, over 12 billion disposable products are sold annually. The market value of disposable pads worldwide will increase from 18 to 26 B USD annually, 2016-2022.

What is the impact of production methods? The impact varies by product. For example, cotton uses about 11,000 litres of water to produce 1 kilogram of cotton. It occupies 2.5% of agricultural land area, but uses 7% of the pesticides, and 16% of insecticides used in farming globally each year.

What is the impact of disposal on the environment? One estimate is that menstrual products form around 6.3% of the sewage-related debris along rivers and beaches. In the European Union, plastics in products like tampons and pads were among the five most commonly found items in marine debris. One estimate is that 252 million menstrual pads will clog European seas and beaches by 2030.

What is the impact on sewage systems? Menstruators often dispose of menstrual products in toilets, latrines or in the open for fear of being observed, for convenience, or because there are no bins. Menstrual products are designed to swell to absorb fluid, thus risking blocking sewage pipes. Sanitation companies around the world report that menstrual products are involved in 80-90% of these blockages. Some manufacturers label their material as 'flushable', but the base for stating this is not clear.

What is the impact on sanitation workers? Sludge removed from pit latrines may be used as fertilizer, but after menstrual products are removed by sanitation workers. They report this as their biggest source of disgust.

What is being done? Countries across the world are taking steps to reduce plastic waste. The European Commission recently passed a law limiting use of some single-use plastic products. Disposable menstrual products ranked high on the list of plastic waste items, but were not banned as they were "items with none or difficult alternatives". The European Commission suggested that manufacturers in Europe should provide information on plastic ingredients, recommended method of disposal, and environmental impacts.

Conclusion/recommendations: Knowledge is poor. Where evidence exists, it indicates significant environmental impact in key areas (e.g. maritime pollution). We should urge lawmakers to continue to make disclosure of product ingredients mandatory not automatically conclude that alternatives are not available (e.g. reusable pads or menstrual cups), make it possible for users to employ the safest possible method of disposal (e.g. bins rather than latrines), and researchers to do further studies, e.g. to what extent menstrual product ingredients are harmful and biodegradable.

This is the best evidence we could find. Comments warmly welcome! (please write andisheh.jahangir@womena.dk)

¹ Research for this FAQ was by Andisheh Jahangir and Katinka Inger. Comments by Janie Hampton and Helen Maria Lynn are gratefully acknowledged. Please refer to WoMena FAQ: harmful substances (forthcoming <http://womena.dk/faqs/>) for more information on the health effects on individual menstruators. We use the term 'menstruator' to acknowledge that not all women menstruate, and not all menstruators are women.

Introduction

WoMena receives many questions about the use of menstrual cups, from the community we reach out to, from our trainers and from our partners. Therefore, we have created a series titled “WoMena FAQs” where we address these questions and answer them based on the best available scientific literature, consultation with experts, health authority guidelines and manufacturer advice. Please see the end of the document for an explanation of the terms used.

Which, and how many, menstrual products are used? What is their content?

We focus on commercially available, disposable products such as pads and tampons, as well as reusable products such as washable cloth, pads or menstrual cups. We would have liked to add estimates for homemade or traditional products such as banana leaves, corn cobs, mattress stuffing. A common method of menstrual management in low-income countries is to use rags or cloths which are washed, and then dried in private places. Environmentally these require less to produce, but use more water. However, whereas some estimates are available in small-scale studies, we found little which could form the basis for national, or international estimates². These products are made from a mixture of materials, including cotton, rayon, polyester, and cellulose, fillers, and layer of plastic to prevent leakage³. Some contain chemicals such as dioxins, containing chlorine and polythene that may produce dioxins furans, pesticide residues and fragrance chemicals. Biodegradable materials are estimated to take minimum 6 months to biodegrade; plastic up to several hundred years; for cups there is no estimate of how long they take to biodegrade, but menstruators will require only 4 in a lifetime.

Estimates for how many products are used per cycle differ widely. Approximately 25% of the world population are females aged 15-49 (UN, 2017), and that can also be used as a very rough estimate of the proportion of the population who menstruate (Tellier, 2018). One estimate from a high-income country is that a menstruator will use between 11,000 and 16,800 disposable menstrual products in a lifetime which is about 32 products each period. This translates into almost 200 kilograms of disposable products thrown away by a lifetime of menstruating (WEN, 2018). Similarly, Stein and Kim estimate that a menstruator will use between 12,000 and 15,000 tampons, pads and panty liners in a lifetime (Stein and Kim, 2009). However, estimates vary by level of income. We found no large-scale estimates for how many products menstruators use in Low Income countries, but menstruators in a country like Uganda often report using 10-20 products each period (Care international and WoMena Uganda, 2018). This would translate into 130-260 disposable products per year.

Globally, over 12 billion disposable menstrual products are used per year, filling up latrine or ending up in landfills. Disposable menstrual products also create approximately 6.3% of sewage-related debris along rivers and beaches. The leaching chemical cocktail from most disposable menstrual products can have a detrimental impact on the environment. The disposable menstrual products often entail: the sourcing of raw materials, shipment to a manufacturing site and assembly/production, another round of transport for distribution and sale, use and then transported again for disposal. If incorrectly disposed, they may end up in the ocean which threaten marine life.

More recently, reusable menstrual products like menstrual cups, reusable pads, and absorbable underwear have increased in popularity because of their reusability, creating less overall waste, fewer chemicals used, and being less expensive. When comparing the environmental impact of different

² PMA2020 has useful estimates, but they are difficult to use in making national or global estimates, as they have little disaggregation by product, and at times have only subnational estimates (e.g. urban vs rural).

³ A BBC news article claims that pads contain as much plastic as 4 supermarket bags, but we have so far been unable to find the original source for this.

menstrual products, reusable products especially menstrual cups have the least environmental impact because of their durability (Weir, 2015).

What are current menstrual waste policies?

The safe disposal of used menstrual products places a burden on the user, sanitation systems, and the environment. A review of literature shows that menstrual waste management is not considered in the majority of Menstrual Health Management (MHM) and sanitation designs, leading to improper management at individual, community, and institutional levels. In addition, nations categorise menstrual waste differently, including 'common household waste', 'hazardous household waste', 'biomedical waste', or 'plastic waste' (Elledge, 2018; Campbell, 2018).

How do menstruators manage menstrual waste?

Menstruators generally dispose of used menstrual products in flush toilets, dustbins, open pits, latrines, or by burning or burying them (Elledge et al., 2018). The way menstruators manage may differ depending on whether they are at home or away. For example, they may use dustbins domestically, but in public places they may flush disposable pads down toilets, either because the bins are full, or dirty, or for fear of being observed. This behaviour has been observed in High, Middle, and Low Income Countries (Kaur, 2018; Kjellén et al., 2012; Elledge et al., 2018).

How does menstrual waste contribute to the problem of blockage of pipes?

Disposable menstrual pads and tampons made from super absorbent polymers (SAP) cause problems because they swell up once they are saturated with fluid and when flushed down the toilet can block pipes (Sommer et al., 2013; Elledge et al., 2018). Moreover, when disposed of, used menstrual products are often wrapped in plastic which further reduces decomposition. Even the products categorised as biodegradable accumulate in waste management systems (Borowski, 2011; Kjellén et al., 2012; Elledge et al., 2018). Sanitation systems are designed for urine and faeces. They are unable to break down solid menstrual products, which cause the sewage pipes to get clogged up and backflow (Kaur et al., 2018).

What is the financial cost of menstrual waste to the sanitation systems around the world?

Sanitation companies around the world report finding large quantities of menstrual waste in the material removed when unblocking pipes. For example in Sana'a, Yemen, the Water and Sanitation Local Corporation records about 1,200 sewage blockages each month, costing USD 24,000. Menstrual products are found in 80-90% of the cases. These problems are not limited to cities in low- and middle-income countries. In London, every year there are 55,000 blockages in the sewer network, at an annual cost of GBP 12 million, with used menstrual products in toilets a contributory factor. In pit latrines, once the sludge has been removed, disposable menstrual products must be extracted before the sludge can be composted or used for agriculture which adds to the cost, and is a source of disgust for sanitation workers (Kjellén et al., 2012).

Research in Scotland highlighted the considerable savings from even a 50% change in menstrual product disposal habits. A switch from disposing through the waterborne sewerage system to a solid waste route would mean savings for the water companies. Savings which would be to the direct benefit

of the water companies and water authorities and ultimately passed on to customers (Ashley et al., 2005; Kjellén et al., 2012).

What is the environmental impact of disposable menstrual waste?

Studies suggest that disposable menstrual products based on rayon and cotton have an acidification and eutrophication environmental impacts, possibly the same impact as plastics (Weir, 2015).

Furthermore, those commercial tampons and disposable pads which contain chlorine and polythene lead to the contamination of the environment, including the sea, groundwaters, and soils if burned (Elledge et al., 2018).

Are there any differences in environmental implications between different menstrual products and methods for disposal menstrual waste?

A study by Weir estimates that the Divacup (a brand of reusable menstrual cup) has the least amount of environmental effect compared to disposable products such as Tampax, Softcup (disposable menstrual cup), and 'o.b.' (a disposable tampon) (Weir, 2015). A global review depicted two harmful consequences of menstrual waste on the environment. One is the accumulation of used menstrual products in landfills, and second, the emission of toxic dioxins and other hazardous gases from incineration because of inadequate emission control measures or poor thermal treatment performance. Landfilling and incineration cause air pollution (Kjellén et al., 2012; Elledge et al., 2018). Even when biodegradable tampons are thrown in landfill due to lack of oxygen would not degrade. The polyester lining and the plastic applicator would also not degrade which in turn leach hormone-disrupting chemicals like bisphenol A into the environment (Davidson, 2012).

From an environmental perspective, reusable menstrual products such as the menstrual cup and reusable pads are more environmentally-friendly, though they require clean water for washing the product, and also hands and soiled underwear. For example, high quality reusable pads may result in less leakage than cloth. WoMena's informal tests and reports indicate that menstrual cups require 1-2 litres of water each period, comparing to 15 litres for reusable pads and cloths (Elledge et al., 2018; CARE International and WoMena Uganda, 2018; Tellier, M.2015. Email to IRise).

What is being done?

In 2018, the European Commission announced that it would take action to tackle the ten plastic waste items most often found on Europe's beaches. Among these, disposable menstrual products like tampons and pads, included under "wet wipes and sanitary items", ranked 5th with total of 9,493 items found on Europe's beaches (European Commission, 2018). The prediction is a total of that 252 million menstrual products will appear in marine litter in Europe's beaches and seas by 2030 (European Commission, 2018).

The reason for this pollution lies mainly in improper waste disposal. Disposable menstrual pads, wet wipes and cotton bud sticks often end up in the ocean when they are flushed down the toilet, instead of being placed in a designated bin (European Commission, 2018).

Thus, with the aim of reducing the amount of plastic in the ocean, the European Commission has agreed on measures to limit production and consumption. The single-use plastic bags and cotton buds will be banned from the market. Menstrual products were labelled as "items with none or difficult alternatives"

(European Commission, 2018), so the European Commission recommends an awareness campaign through labelling. “Certain products will require a clear and standardised labelling which indicates how waste should be disposed, the negative environmental impact of the product, and the presence of plastic in the products. This will apply to sanitary towels, wet wipes and balloons” (European Commission, 2018). The European Commission treats this as a priority file and plans to take implementation measures in 2019.

Conclusions and recommendations:

Evidence is poor. However, there is good evidence that indicates significant environmental impact in key areas (e.g maritime pollution, sanitation systems).

There are also many knowledge and action gaps:

- There is a need for lawmakers to ensure full disclosure by companies of materials used in commercially available products, particularly materials which take long to biodegrade (e.g. plastics) or dangerous chemicals (e.g. chlorine and polythene) (Kjellén et al., 2012; Elledge et al., 2018; Kaur, 2018). This should include an assessment of the environmental lifecycle for each type of menstrual product include the environmental costs across all stages of production, distribution, use and disposal (Weir 2015).
- Materials should be further studied, in terms of potential environmental and health impact for users, sanitation workers who have long-term and cumulative exposure; postmarket surveillance to monitor product defects and health effects should be introduced (Bae et al., 2018).⁴
- Help develop basis for clear categorisation and standardisation of menstrual products and waste, including performance, quality, health and environmental impact. Include reusable and biodegradable products (Sommer et al., 2013), develop standards which will help the introduction of such products (Elledge et al., 2018).
- In the design of sanitation systems (community and institutional), consult with users and sanitation workers, and study results in improving privacy, wellbeing, minimising environmental consequences (Kjellén et al., 2012; Elledge, 2018). Study the role of teachers in providing education to improve practice in disposal habits (Kaur, 2018).
- To the extent relevant and feasible, studies should also include ‘traditional’ products, since a large proportion of menstruators use such products. They cannot automatically be assumed to have no environmental impact.

⁴ See also forthcoming WoMena FAQ on harmful substances

Explanation of terms used

Term	Definition
Acidification	The action or process of making or becoming acidic
Biodegradable	Materials, chemicals etc that are biodegradable are changed naturally by bacteria into substances that do not harm the environment
Bisphenol A	An industrial chemical used to make certain plastics
Bleach	To make things pale or white, or to kill Germs
Carbon disulfide	A colorless toxic flammable liquid used as a solvent
Cellulose	The main component of plant cell walls and of vegetable fibers such as cotton
Chemical cocktail	A combination of harmful substances
Chlorine (chlorine dioxide)	A greenish-yellow gas with a strong smell that is used especially as a bleach and disinfectant
Combustion	The process of burning
Decomposition	The process of decaying
Deodorise	To remove a bad smell or to make it less noticeable
Dioxin	A very poisonous chemical used in industry and farming; carcinogen and endocrine disruptor
Eutrophication	Excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, which causes a dense growth of plant life and death of animal life from lack of oxygen
Fragrance	Organic compounds that evaporate, or vaporize into the air. They are added to products to give them a scent or to mask the odor of other ingredients
Furan	A colourless flammable toxic used in the manufacture of cotton textiles and in the synthesis of nylon
Microflora	The community of microorganisms that live in or on another living organism or in a particular habitat
Noncancerous	Without evidence of cancer
Organochlorines	Any of a large group of pesticides and other synthetic organic compounds containing chlorine
Pesticide	A chemical substance used to kill insects and small animals that destroy crops
Phthalates	A group of chemicals used to make plastics more flexible and harder to break

Plasticizer	Any of a group of substances that are used in plastics or other materials to impart viscosity, flexibility, softness, or other properties to the finished product
Polyester	An artificial fabric
Polymer	A chemical compound that has a simple structure of large molecules
Polythene	A type of plastic
Rayon	A textile fabric made from regenerated cellulose
Residue	A substance that remains on a surface , in a container etc and cannot be removed easily, or that remains after a chemical process
Super absorbent polymer	Super absorbent polymer can absorb and retain extremely large amounts of a liquid relative to their own mass
Synthesis	The production of chemical compounds by reaction from simpler materials
Synthetic	Synthetic products are made from artificial substances
Wood pulp	Wood fiber reduced chemically or mechanically to pulp and used in the manufacture of paper and disposable pads

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