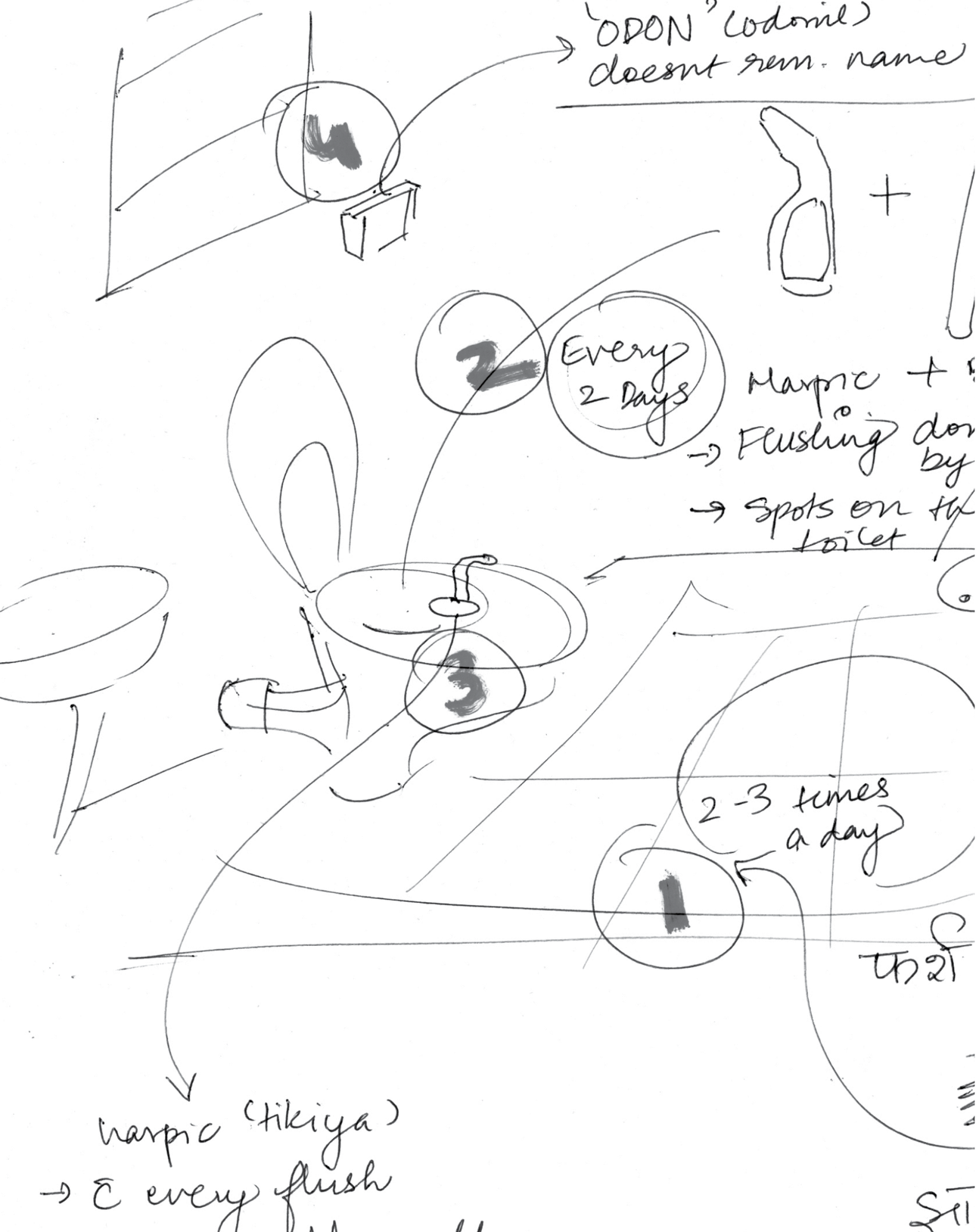
PROJECT LAJJA

PERSPECTIVES ON TOILET MALODOUR



HUMAN DNA HAS THREE RECEPTORS FOR VISION, FIVE FOR TASTE AND 350 FOR SMELL.

Clearly, we've evolved to put our best nostril forward; recent research has shown that multiple decisions we make ranging from identifying potential mates to choosing the most nutritious food, are subconsciously influenced by our sense of smell.

Can this sense of smell impact how we live? Our homes are filled with smells, some pleasant and some repugnant. It is also the one place where we have most control over the smells that we experience. If we take an active role in shaping the smell experiences that surround us in this most intimate of spaces, we will begin to take positive steps towards leading healthier, more fulfilling lives. Within the home, it also then makes sense to address malodour in the toilet, as it is the space that is most susceptible to it.

This primer will give you glimpses into homes and toilets along with the landscape of cleaning products, and will act as a bridge that connects our understanding of the significance of the sense of smell to the many aspects of toilet cleaning behavior.

WHY TOILET MALODOUR?

One of the main objectives of the project is to understand the role malodour plays in disengaging consumers from toilet cleaning – a loaded hypothesis that tries to seek the one or two main benefits we promise the user when it comes to tackling malodour in toilet spaces.

The research brief itself was written with one objective in mind – to capture the unspoken reasons behind apathetic toilet cleaning and hygiene behavior. The end point for us as researchers is to unravel the final impact or the payoff this product's promise has on the consumer's life.

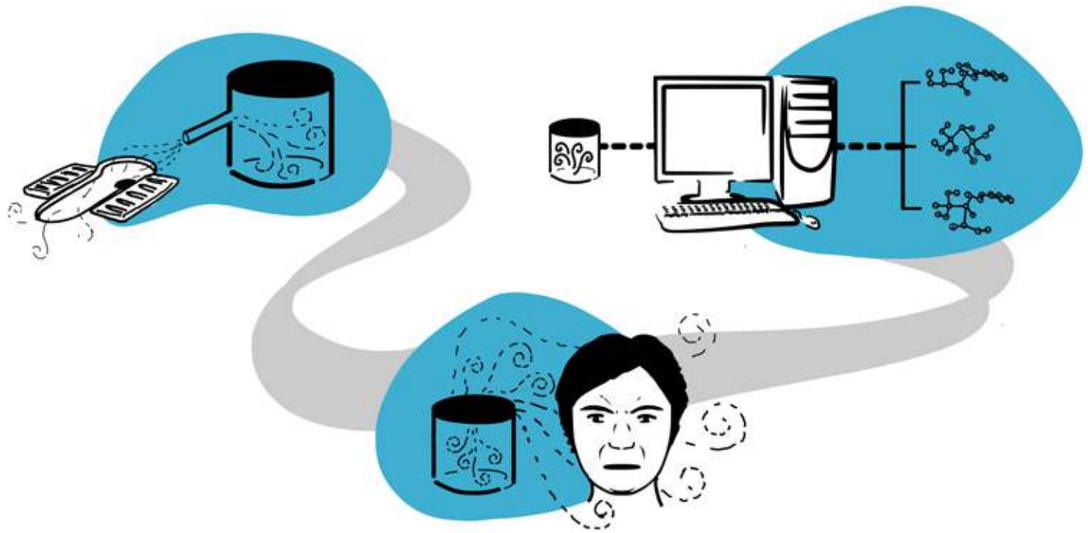
WHAT IS MALODOUR?

This is probably the most challenging yet interesting component of the project. While dinginess and poor ventilation exacerbate apathy towards toilet spaces, we need to unravel the consumer's mental model around Toilet Malodour. Is it fecal in nature ? Is it purely airborne ? And what are the existing solutions that consumers employ to mitigate this phenomenon?

WHAT DO WE GAIN FROM THIS?

Information and insights around cleaning habits and product perception ultimately inspire what Unilever wants to build for the future. Which is why we are simultaneously reaching out to expert stakeholders and conducting secondary research – the triangulation of which should inform new formats, formulations and delivery mechanisms that will serve this pertinent need in a novel way while keeping ground realities in mind.

With the project, we are seeking to establish concepts and consumer commentaries that can enable this new product idea and fit it into existing homes, ecosystems and cultures.



THE HUMAN BRAIN HAS EVOLVED TO PERCEIVE MALODOUR AS AN INDICATOR OF A POTENTIALLY THREATENING OR UNHEALTHY ENVIRONMENT. IT SERVES TO ALERT US TO UNHEALTHY SCENARIOS THAT ARE POTENTIALLY HAZARDOUS TO HEALTH AND NEED TO BE AVOIDED.

ON THE WORK GOING ON AT SPB VLAARDINGEN

We are currently working to study malodour and it's components. What makes a malodour? Which of the millions of compounds around us combine in ways that cause a bad smell?

We apply new and interesting technologies, to collect samples of air with bad smells and break them down into their constituent molecules to see which parts lead to the strongest reaction of disgust, aiding the targeting and neutralization of individual compounds.

SOME TECHNIQUES TO DEVELOP MALODOUR-FIGHTING AGENTS

We can sample a room and understand what all the various smells are and what they are made of. This allows us to conduct detailed experiments with the individual malodourous compounds.

We collect a sample of gas to be studied, which is sent in for 'sensory profiling' which is a process that records immediate indications of disgust.

The next step would be to use a 'face-reader', a type of software that analyses your face when reacting to various smells and rates the disgust you experienced based on facial feature contortions.

Then, the smell is run through the 'GC' or gas chromatograph, which will tell us what the individual components of the smell are. We then conduct a process known as preference mapping, where we analyze each component smell and map them to the associated disgust levels.

You can think of it as the same as trying to find out what individual aspects people like about an apple. We break a scent into all it's individual constituent parts, and then try to analyze which of them is contributing to the malodour component and in what manner.

WOMEN IN INDIAN HOMES ARE AMAZING TASK MANAGERS WHO BALANCE A SPECTRUM OF TASKS AND ROLES.

She lives out the responsibility of taking care of the elders, her husband and children, while also taking care of mundane cleaning and upkeep, on a daily basis. Apart from this, she anchors social and emotional ties with the extended family and the neighbourhood.

This role as a caretaker also extends to the toilet space, where the woman of the family goes out of her way to ensure that the toilet is kept as clean and hygienic as possible, waging a continuous war against filth, dirt, stains, mildew and malodour.

EVERYTHING IS SO EXPENSIVE. I DON'T NEED MUCH MYSELF, SO I TRY AND PITCH IN TO HELP MY CHILDREN IN WHATEVER MANNER POSSIBLE.

Meenakshi

A mother's worry never ends, no matter how many years go by. Meenakshi is over 60 years old, and she still worries about her fully grown children. Despite being hard pressed for money themselves, she and her husband send them money whenever they can. She also does all she can to help take care of her six grandchildren.

Eat, Work, Pray, Sleep / She and her husband lead a pretty simple life, with very basic needs and habits. Drinking tea in the houses that she works in, she manages to even minimize the purchase of essentials, like tea leaves.
Meenakshi hopes that her husband and she will be able to save enough to leave behind something for their grandchildren.

I BUY EYESHADOW FROM THE LADY NEXT DOOR. SHE LETS ME TRY IT ON BEFORE BUYING.

Nagma

Being homebound most of the time, opportunities like these are rare for Nagma. Most of the house work is shared between Nagma and her older sister-in-law, with her *ammi* chipping in now and then. She wakes up early to clean the house and cook for the family, before the others wake up. Once the children wake up, it is difficult for her to get any work done.

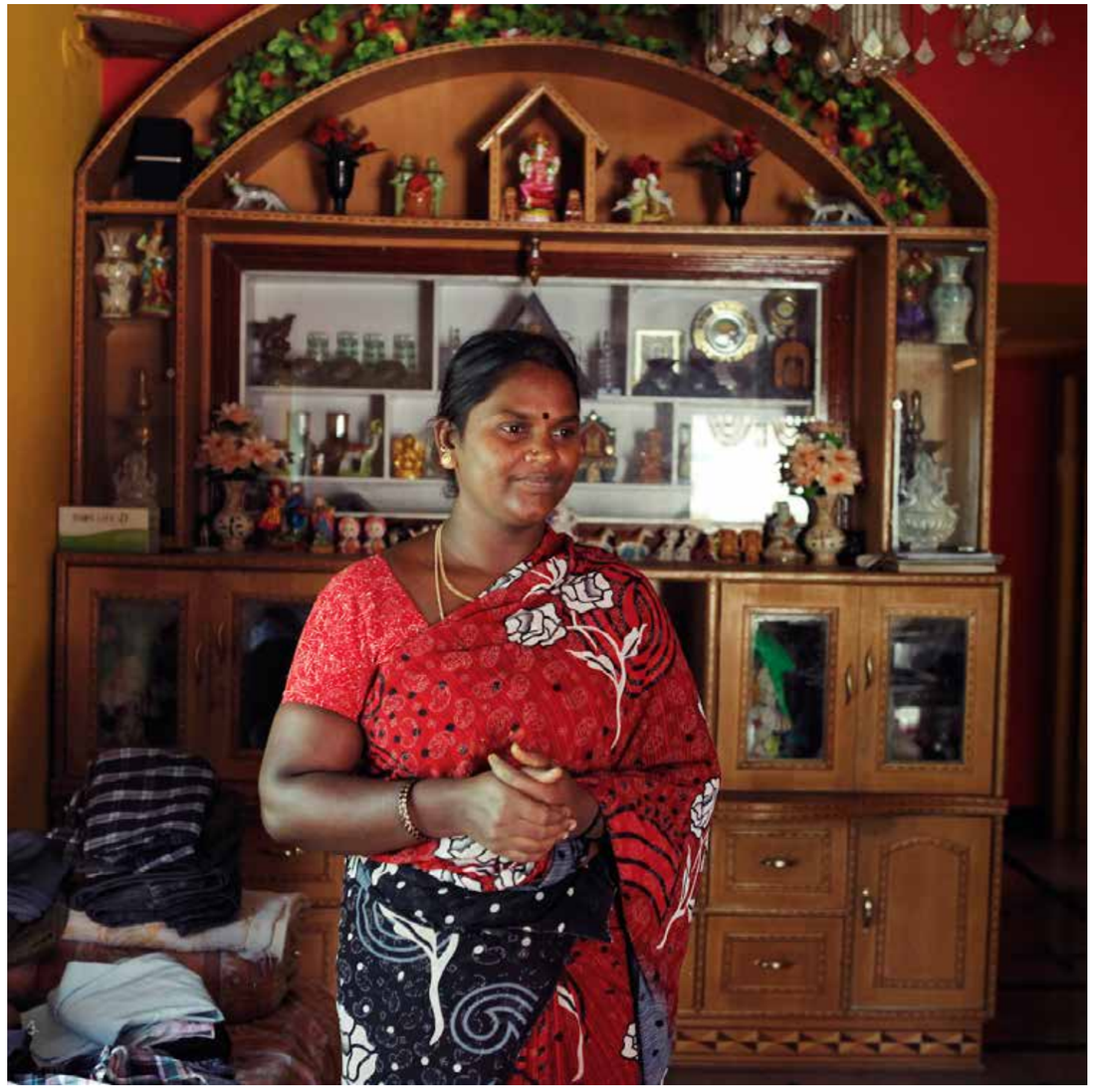
Despite the relatively mundane nature of cleaning tasks and the associated tediousness, Nagma goes about it with diligence and does not shirk any chore. She navigates her multiple roles within the family well, as she moves between feeding her children and cleaning the house. It almost seems like she is in many places at once.

I TAUGHT MY SON THE HEALTHY HAND WASH- LIKE THEY SHOW ON TV.

Payal

Her son's well-being occupies prime mind space for Payal; most of her day goes in taking care of him. Earlier, Payal's time was spent taking care of her husband and the house. But now her hands are full with the child, day & night, as she does not like to let him out of her sight for even a second. Her husband supports and understands his wife's maternal instincts and even helps her now in chores around the house.

With the child around, the floors are now mopped twice or thrice a day with Dettol to keep them germ free. Various surfaces have protective plastic covers, saving Payal a lot of time while cleaning – precious time that she can spend with her baby, which she can never have enough of.



I MAKE DELICIOUS FOOD. BUT I NEVER GET THE OPPORTUNITY AT HOME AS MY MOTHER-IN-LAW COOKS FOR ALL OF US. I WOULD LOVE TO WORK AS A COOK SOMEWHERE.

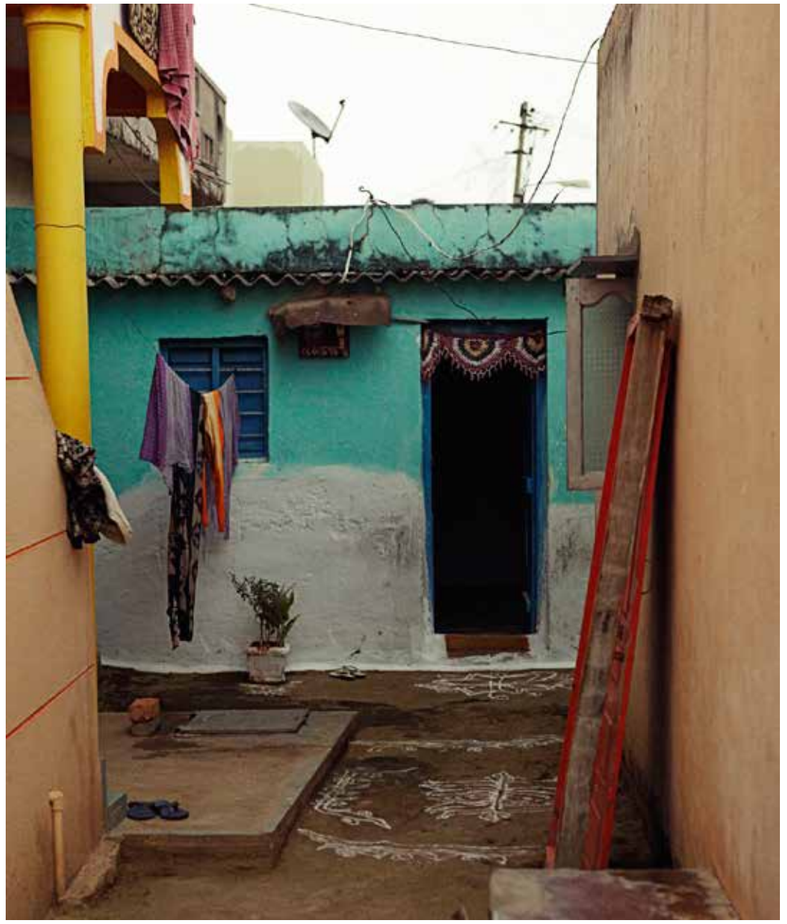
Latha

Managing the home with two teenage boys is a steep task. But Latha manages quite well and the house is run like a well-oiled machine. She even desires to get a 'real job for some exposure to the world.' But she knows her husband wouldn't like it because it would go against some of his old-fashioned beliefs.

She does all she can to make her home better, including reading up on home care tips, from all the magazines she can get her hands on.

So she has much to say about air circulation, side effects of products, benefits of aloe vera and homeopathy; and she proactively seeks to bring this knowledge to practice in her home. One of the things she has learnt is that good things take time; anything that 'produces results quickly cannot be good for you'.

DIRT, DUST & STINK, COME FROM OUTSIDE.
MALODOUR IN THE HOME IS PRIMARILY A FUNCTION OF POOR INFRASTRUCTURE AND UNHEALTHY SURROUNDINGS, AND NOT ONLY OF INADEQUATE CLEANING FREQUENCY OR BAD PRACTICES.

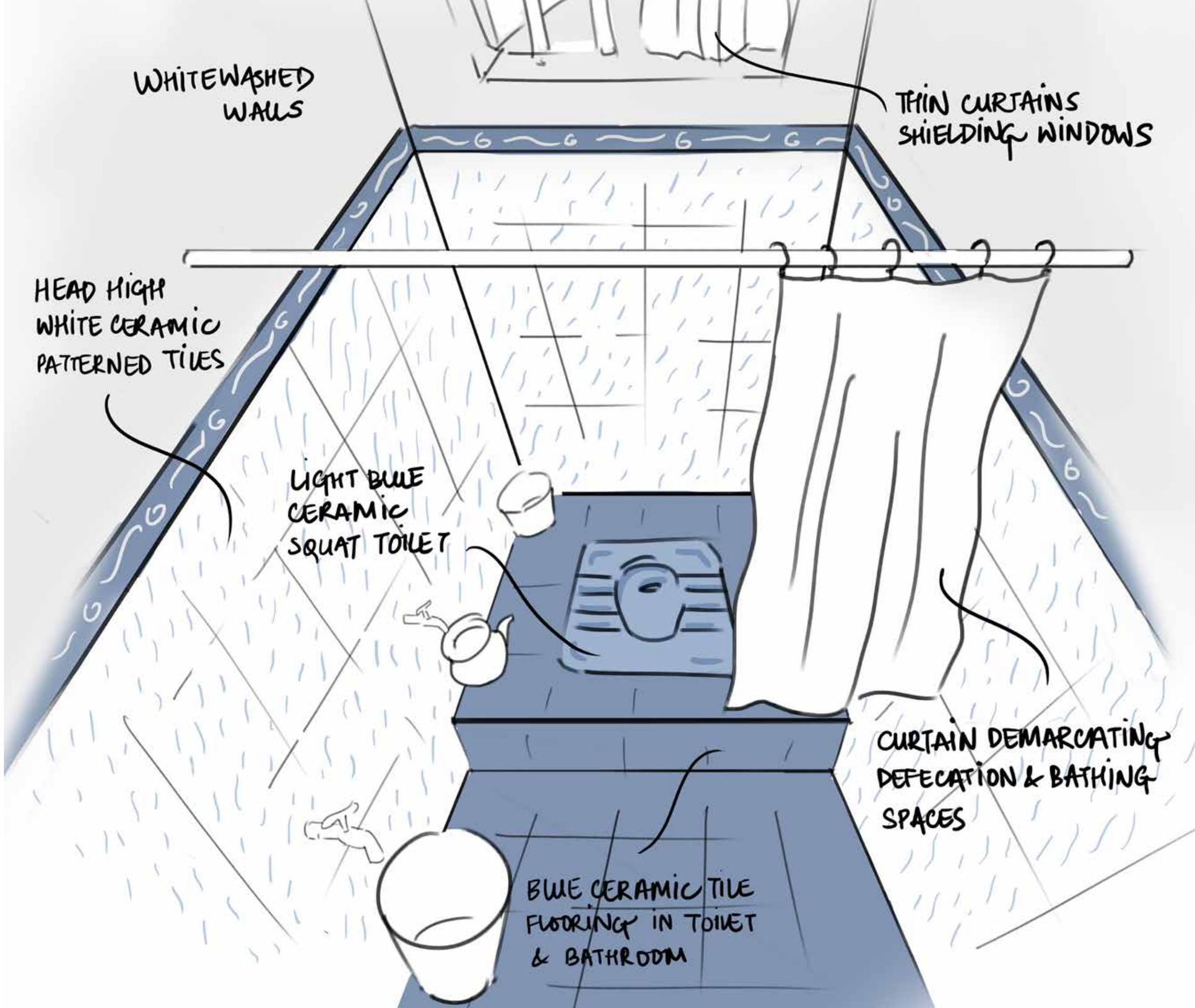


There are some things I cannot control, like the broken pipes or *naalas* outside the house which cause a terrible stink, but I make sure that I take special care with the things I can control.

I want to make my house a hygienic and pleasing space for myself and my family. Since we have to do it on a budget, I prioritize hygiene and cleanliness, after which I can think of decorating or putting pretty things up for display.

TOILETS HAVE A BIG IMPACT, THOUGH THEY ARE A SMALL SPACE IN THE HOUSE.

Most people living in low-income housing, have small houses and the toilet is an even smaller space within it. Apart from the toilet itself, other chores such as bathing, laundry, and the final stages of dishwashing find a staging ground within this space. When it is within the house, it is also located in close proximity to spaces like the kitchen and the bedroom and thus require some special care.



① SEEMA'S TOILET

CHEST HIGH WATERPROOF PAINT

WHITEWASH / LIME WALLS

SMALL LIGHT OPENING

WHITE CERAMIC BOWL

GRANITE PARTITION B/W BATH & TOILET

WHITE CERAMIC TILES

② BIMLA'S TOILET

CURTAIN (instead of door)

EXPOSED BRICK WALL

CEMENT FLOOR

PAINT PEEL-OFF

CERAMIC SQUAT BOWL (White)

PAINT

CHEST HIGH PATTERNED CERAMIC TILES

STONE (yellow)

CERAMIC SQUAT TOILET (light blue)

CEMENT FLOOR

③ KAMLESH'S

TOILET

DEFECATION

BATH

BATHING & CLOTHES WASHING

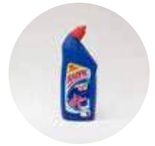
WASH BASIN

LIVING + BEDROOM

KITCHEN

TOILETS ARE MADE OF MULTIPLE SURFACES & MATERIALS,
NECESSITATING SEPARATE, TARGETED METHODS OF CLEANING.

Care for these multiple surfaces have different needs, priorities and frequencies, thus necessitating multiple products, ranging from branded cleaning products to 'me-too' alternatives made locally, as well as commodity solutions for specific tasks.



CLEANING IMPLEMENTS

Toilet Brush
Originally made of pig bristles or horsehair, the toilet brush has been around since the 1930's and has hardly seen any change in design and ergonomics since then! It is confined only to the toilet space but could get used on surfaces other than the toilet bowl as well.

Toothbrush
A common modification to old toothbrushes to make them more useful as surface cleaners or scrubbers, is to increase their surface area by tying a *pocha* cloth (old garment bits) around the head of the brush.

Seekh Jhadoo
Valued for it's hardiness and flexibility, the *seekh jhadoo* is a common fixture in households across LSMs in India. It is typically used to clean wet floors in the bathroom as well as outdoor spaces, and is made from the stems of dried coconut leaves and sold through informal markets.

Iron Wool in Detergent Bag
An interesting local invention, where the iron wool acts as a mild scrubbing agent to break loose the most persistent of stains and encrusted debris, while the detergent wrapper helps to protect the user's hands.

Squeegee
Referred to as a 'swiper' or 'wiper', it fulfills the important role of aiding to keep the toilet dry. The Squeegee was originally invented by fishermen, who wanted a simple, functional implement to rid their boats of sea water and the blood and scales of their daily catch.

Mason Stone
Likely the most specialized tool in the arsenal of toilet cleaning implements in people's homes, the mason stone is used primarily to scrape clean the joints between the tiles and the floor or the grouting in the gaps between tiles.

CLEANING AGENTS

Harpic
Harpic is used primarily to give porcelain a 'shine'. A small quantity is drizzled on to the toilet bowl surface, after which a little water is used to vigorously scrub the entire surface with a toilet brush, before flushing clean with plenty of water.

Phenyl
Phenyl is used as a generic name for all floor cleaning products that are diluted in water, for use with a wash cloth or *pocha*. Possibly the most diverse category of household cleaners, multiple local brands with dozens of color & fragrance variants are available. The distinct smell masks malodour, making it a preferred solution for quick treatment in the toilet and other parts of the house.

'Surf'
Another brand name that has become a generic descriptor, 'Surf' refers to any powdered laundry detergent that is used as a 'catch-all' cleaning solution. A small quantity of 'Surf' is dissolved in water, and the solution is poured onto the floor with a mug. Scrubbing with a *seekh jhadoo* and rinsing with water completes the cleaning job.

Water
Water is used, re-used, recycled and repurposed continuously. There is a strong belief that continuously flushing the toilet with water will push fecal matter away from the home which results in an almost constant effort to flush the toilet regularly. Used water from laundry, dirty water left over from floor cleaning or fresh water from the tap is also thrown into the toilet bowl, as it provides a convenient disposal outlet, while also providing an extra round of flushing.

Acid
Acid is the 'nuclear option' of toilet cleaning agents, used infrequently because of concerns about it being harmful to users as well as materials and surfaces in the toilet. It is drizzled onto the floors liberally and allowed to 'sizzle' and 'bubble', both indicative of cleansing action. Acid also minimises effort by eliminating the need for hard scrubbing.

Odonil
The most common brand of block air fresheners, primarily used in toilets. While there is a stated need, some users have tried it out but haven't sustained it's use, due to the lack of a strong enough benefit. Fragrance benefits tend to be too mild to justify it's purchase for use in the toilet.

HARPIC THE 'XEROX' OF TOILET CLEANERS.

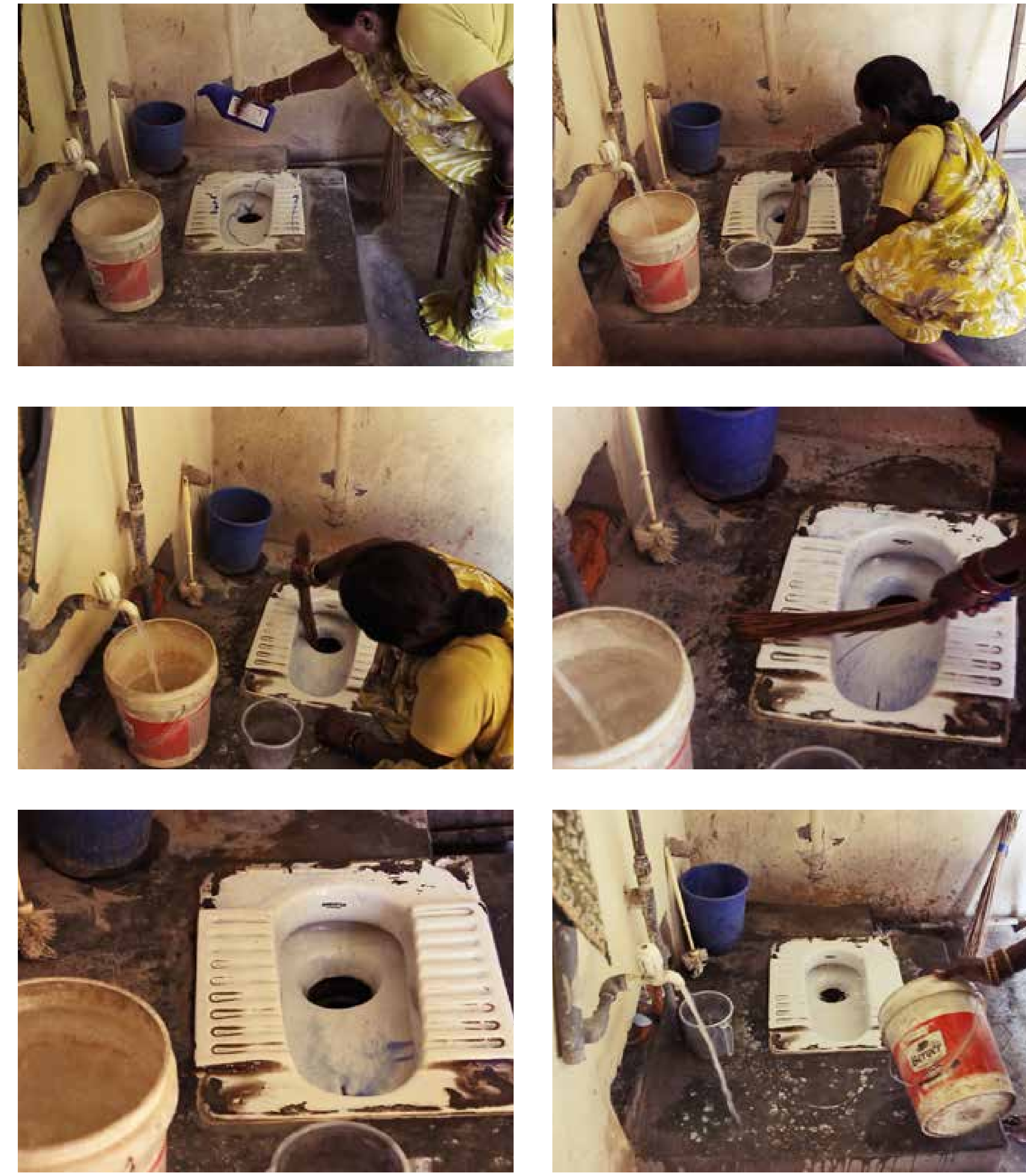
HARPIC has become a generic descriptor for toilet cleaners, a category with many look-alike products from big brands as well as smaller, locally made products.

Easily identified by the blue bottle and 'duck' shaped neck with a red cap which has become the hall-mark of the category, these products share shelf space in local *kirana* stores, as well as more high-end department stores and supermarkets.

They also share space in the consumers minds, with brands such as CleanMate and SaniFresh being common in Delhi,Lucknow and Bangalore.

This elevation of a brand name or 'keyword' from signifying one particular product to becoming the descriptor for the category as a whole is common in this segment, where 'brand loyalty' does not exist and has been replaced with 'price loyalty', where consumers are very open to trying alternative products in the same price range.

A TV advertisement for Harpic showing the 'ideal' method to use the product



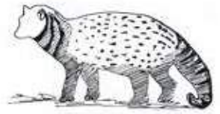
Typical usage of a specialized toilet cleaner in the real world

CLEANING TOOLS AND PRODUCTS ARE UNIVERSAL.

A quick visit to a public toilet led us to the caretaker who had an arsenal of products and tools for different cleaning purposes. Though the intensity of effort and cleaning is much higher than in individual homes, the overall landscape of products and tools had several commonalities.

DID YOU KNOW?

A COLLECTION OF INTERESTING TIT-BITS OF INFORMATION UNEARTHED DURING THE COURSE OF THIS PROJECT. SOME ARE ARCANE, SOME ARE SHOCKING, ALL ARE FASCINATING!



MEET THE CIVET

A small, cat-like animal that lives in Africa has been an inspiration to some of the world's greatest perfumers for centuries. The African Civet secretes a potent musk that it uses to mark it's territory.

This musk is so distinctive that it has long been the favored ingredient in the most exclusive perfumes, from Chanel to Dior. Now, however, the Civet's endangered status has led to most perfumers abandoning natural musk in favor of a chemically engineered alternative.

A SENSE IN FLUX

Our sense of smell is continuously changing, waxing and waning daily - it is weakest when we awake, getting stronger as the day goes on. Also at it's strongest between the ages of 8 & 15, our olfactory system goes into decline after we're thirty.

Smell also varies between the sexes, the fairer sex being better at sniffing out scents. In fact, women also experience a period of heightened smell during the days of peak fertility in the menstrual cycle.

SMELLING IS TASTING IS SMELLING

We are familiar with the process of taking in odour molecules from the air as we inhale. A lesser known mode of olfaction, called 'retro-nasal olfaction' occurs as we exhale.

While eating, the air we exhale is densely packed with odour molecules from the food we're chewing, so the smell centers get a large dose of odour molecules, as much as 70-80% of the sense we perceive as taste!

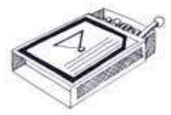
YOU ARE WHAT YOU SMELL

Recent research has found a surprising correlation between people with a tendency to be over-weight and those with a strong sense of smell. This may be because a stronger sense of smell leads to an increased preference for 'junk' foods, which typically contain artificial odourants.

People with a better sense of smell, naturally gravitate towards these and hence the higher correlation between the high olfactory acuity and a higher BMI.

UNDER THE LID

In a western toilet, the flush activates a large volume of water that flows at high pressure into a confined space, leading to millions of fecal particulate matter getting dispersed into the confined air space of the toilet. Keeping the lid down prevents this spray from leaving the bowl. Squat toilets are typically flushed with less force and hence do not need a lid.



LIGHT A MATCH

While there is little doubt that lighting a match in the loo can get rid of the lingering smells emanating from last night's dinner, most people have no idea how it actually works. One common theory is that the flame burns away the offensive smells, but this has since been discredited.

The real reason is that the flame releases activated carbon into the air, neutralizing the bad smells.

THE RUNNER'S REMEDY

The fastest human runners can clock in at almost 45 Kmph, but even that isn't fast enough to outrun the smell of stinky running shoes!

A favorite tip amongst the running community is to line the inside of trainers with some baking soda because of it's magical ability to trap and absorb bad smells.

HOW KITTY LITTER WORKS

Most kitty litter prevents bad smells from spreading in two ways: special clays in the mixture are aggressively 'Hygroscopic' i.e. they attract and retain water molecules very well. Since urine or fecal matter is immediately dried out, there is very little time for bad smells to escape and no way for any bacterial proliferation to occur.

Kitty litter also contains activated carbon, which immediately traps offensive odours and neutralizes them.

SMELL AND THE PERCEPTION OF TIME

A recent study showed a surprising correlation between the smells around us and our perception of the passage of time.

Scientists have found that soothing smells, like that of baby powder, could lead to the passing of time being perceived as almost 50% slower than normal, while more active smells, like coffee beans, lead to a 'speeding up' of time by 10-15%.

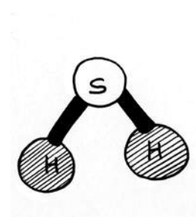
NOSTRILS WORK IN SHIFTS

The primary function of nostrils is to warm the air entering the nasal cavity, which improves odourant detection. This is accomplished by mucous membranes inside the nostrils, which are fragile and need to take a break so they can rejuvenate.

This 'break' is accomplished by a two hour 'nasal cycle', where one nostril performs a majority of the inhalation, while the other recuperates, and then they switch.

HOW DOES ACTIVATED CARBON WORK?

Activated carbon has an exceptionally high ratio of surface area to mass – just 1 teaspoon of molecules would have a surface area equivalent to a football field! This means that the molecule has a huge surface onto which it can 'adsorb' odour molecules, trapping them and preventing us from inhaling them.



HYDROGEN SULFIDE

What's flammable, poisonous and smells like rotten eggs? H_2S, of course!

One of the most common malodourous gases, Hydrogen Sulfide is present across flatulence and swamp gas, as a result of anaerobic digestion by a wide variety of bacteria.

Hydrogen Sulfide is not all bad though. Present in minute quantities throughout the body as a signaling molecule, it keeps everything from our heart muscles to our brain working smoothly.

SCENT STORIES 1

Gender and scent
“There are no gender specific scents; that is just a notion perpetuated to increase the number of perfumes sold.” The idea of masculine and feminine scents has no scientific backing. Similar to the concept of blue for boys and pink for girls, this belief is the result of western cultural influences from the 19th century.

SCENT STORIES 2

Petrichor
"It's *geeli mitti*", he said and placed a small drop on my wrist. The *ittar* that smells like first rain on parched land, also called Petrichor, delivered everything that the name promised. I took a breath and memories of my childhood spent in monsoon drenched villages, exploded in my head.

SCENT STORIES 3

No bad smell
"Bad odour is just a very strong form of good odour. Dilute the scent and you will have a nice smell", said Ram Singh, proprietor of Gulab Singh Johri Mal, a shop that has been specializing in *ittars*, perfumes and other perfuming products.

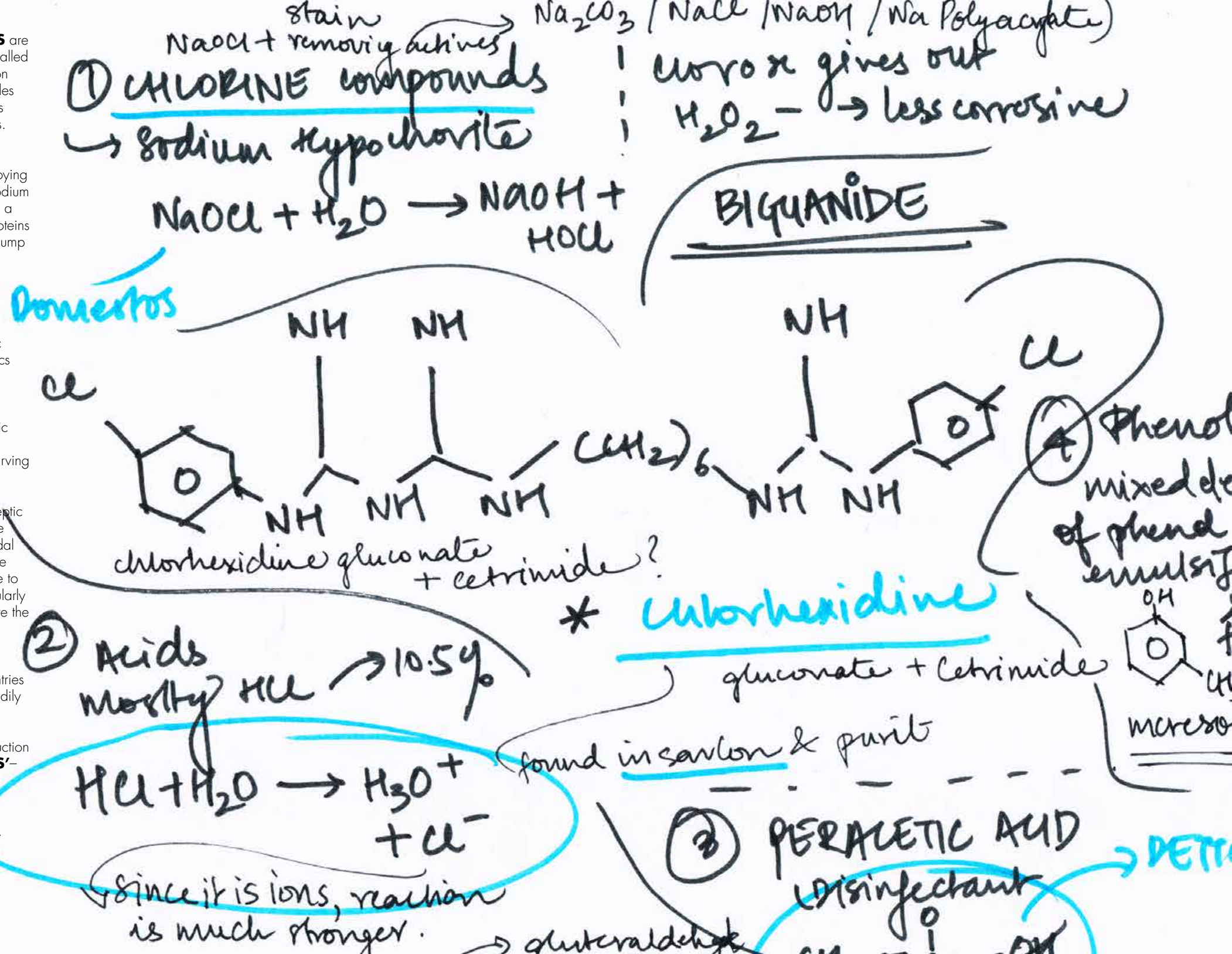
ANTISEPTICS and **DISINFECTANTS** are broad categories of chemical agents, called biocides, used for antisepsis, disinfection and preservation. Many of these biocides such as alcohols, phenols and halogens have been known for hundreds of years.

Each of these agents has a different mechanism to make it effective at destroying microbes. For instance, Bleach, with Sodium hypochlorite as its active agent, creates a 'heat-shock' effect that denatures the proteins in the bacterial cells, causing them to clump together, similar to the effect seen when boiling an egg.

In general, biocides have a broader spectrum of activity than antibiotic agents, which typically target a specific microbe or order of microbes. Antiseptics contain agents that destroy or inhibit the growth of maicroorganisms in or on living tissue. Chloroxylenol, or 4-chloro, 3-5-dimethylphenol, is a strong antiseptic which disrupts the potential across a microbe's cell membrane, effectively starving it to death.

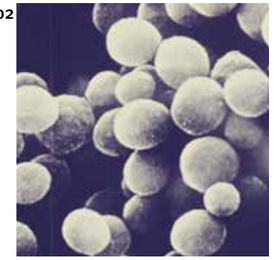
The proliferation of antibiotic and antiseptic products has also resulted in a miniature arms race between germs and germicidal agents designed to combat them. As we deploy stronger drugs, the germs evolve to become resistant to them. This is particularly visible in the sphere of antibiotics, where the development of 'superbugs' like MRSA, an antibiotic-resistant strain of the Staphylococcus bacillus has caused significant alarm, prompting many countries to pass laws making antibiotics less readily available to the public.

This arms race has spawned the introduction of **'PREBIOTICS'** and **'PROBIOTICS'**– live microorganism cultures which when ingested are believed to target certain harmful microbes without causing any collateral damage to the host organism.

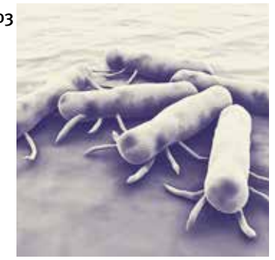


01

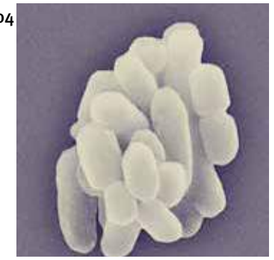
02



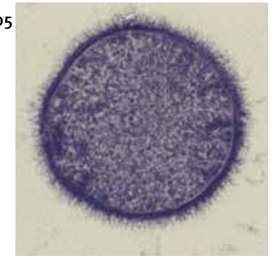
03



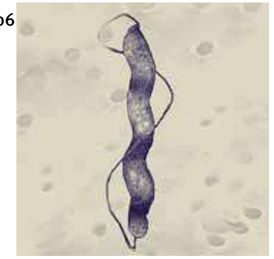
04



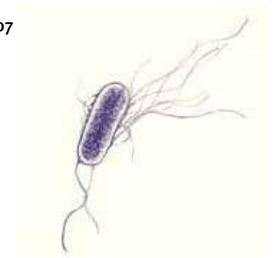
05



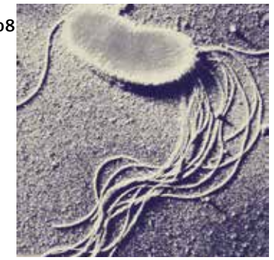
06



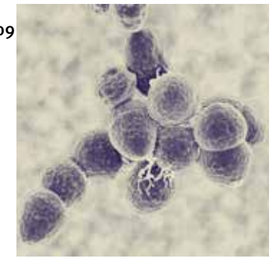
07



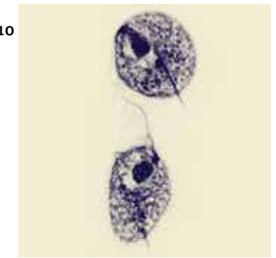
08



09



10



Q. WHAT ARE THE 10 MOST COMMONLY FOUND MICROORGANISMS IN URBAN HOMES?

01 **SHIGELLOSIS**
One of the most common bacteria found in toilet bowls, Shigellosis can cause a wide variety of illnesses, including severe diarrhoea and dysentery.

02 **STAPHYLOCOCCUS**
The cause of many different ailments and diseases, staphylococcus bacteria are robust and resistant to many disinfectants and antibiotics.

03 **SALMONELLA**
Often found in the water seal of toilet bowls, Salmonella can be very harmful and cause severe vomiting and Diarrhoea.

04 **SERRATIA MARCESCENS**
A benign bacterium that is very common in the toilet and the environment at large, Serratia causes a grey or pink lining inside the toilet bowl, but is not harmful to humans.

05 **BACILLUS SUBTILIS**
Also called the 'Hay Bacillus', it is found commonly in earth and mud, but is also known to be a common bacterium in the human intestines.
It is harmless to humans, and is in fact used as a probiotic method for fighting infections.

06 **CAMPYLOBACTER**
Frequently found in the intestinal tracts of animals and humans, Campylobacter, along with E.Coli is the most common cause of diarrhoea world wide.

07 **ESCHERICHIA COLI**
Found in both harmful and benign strains, E.Coli is found everywhere in the home, including the toilet. E.Coli is the most common bacterium in cases of food poisoning; infections typically occur through fecal-oral transmission and can cause vomiting and severe Diarrhoea.

08 **PSEUDOMONAS**
Commonly found throughout the environment, Pseudomonas particularly inhabit damp or moist areas like the toilet bowl, walls and floor of toilets. Pseudomonas can cause harmful infections in individuals with reduced immunity.

09 **STREPTOCOCCUS**
The cause of common ear, nose and throat infections, Streptococcus is passed through sneezing or hand-mouth contact. It can be found throughout the home on surfaces and objects that are frequently touched or handled.

10 **TRICHOMONAS VAGINALIS**
A protozoa, Trichomonas is the most common pathogenic cause of infection in the developed world. It is transmitted sexually but can also survive on hard surfaces such as toilet seats for brief periods without a host.

READ MORE

http://bop-projectlajja.com

THANKS!

"Subject Matter Expert" doesn't quite do justice to how helpful some of these people were:

- Valerie Curtis, London School of Hygiene and Tropical Medicine
- Walter Gibson, London School of Hygiene and Tropical Medicine
- Mansoor Siddiqi, Idea Ricochet
- Ram Singh, Gulab Singh Johri Mal Perfumers
- R.K. Saxena, Professor of Microbiology, Delhi University

Unilever:

- Arindam Som
- Hoa Le-Thuy-Phuong
- Lynda Grainger
- Monique Smeets
- Prashant Jain
- Sandeep Verma
- Sara Ferrari

APPENDIX

Enjoyed by our **Did you know** section? Here are some people and books you might find interesting:

PEOPLE

- Luca Turin, Biophysicist, Author of *Perfumes: The A–Z Guide*
- Rachel Herz, Cognitive Neurologist, Author of *The Scent of Desire*
- Richard Axel & Linda Buck, Neuroscientists, Nobel prize winners in Physiology, 2004
- Kate McLean, Designer, Artist, Creator of *The Sensory Maps Project*
- Sissel Tolaas, Odour Artist

BOOKS

- The Emperor of Scent - Chandler Burr
- Perfumes: The A-Z Guide - Luca Turin, Tania Sanchez
- Essence & Alchemy: A Natural History of Perfume - Mandy Aftel
- The Scent of Desire: Discovering our Enigmatic Sense of Smell - Rachel Herz
- Remembering Smell: A memoir of losing and discovering the primal sense
- Scent: the Mysterious and Essential Powers of Smell - Annick Le Guerer
- Jacobson's Organ - Watson Lyall
- What the nose knows: The science of scent in everyday life - Avery Gilbert

WEBSITES

Smell & Taste | Treatment & Research Foundation
http://www.smellandtaste.org/

Sense of Smell Institute
http://www.senseofsmell.org/

Sissel Tolaas
http://www.researchcatalogue.net

Directory of Open Journals
http://www.doaj.org/

Google Scholar
http://scholar.google.com

Quora.com | Topic: Smell
http://www.quora.com/Smell-and-Smells