In the western state of Rajasthan, community hand pumps are the main source of drinking water in rural villages. After a persistent five-year drought in this state, groundwater has dipped to dangerously low levels requiring water mining. This process has lead to a serious groundwater quality problem, specifically high levels of fluoride concentration (3-4 ppm) in all 32 districts of Rajasthan. The optimum level of fluoride in drinking water is 1-1.5 ppm. Although the government has installed filters on some hand pumps, these filters need to be recharged via a regeneration process; a procedure that only takes place if they are monitored and supported by government or other agencies. Compounding this scenario, the amount of fluoride deposited in bone is influenced by factors such as age, nutritional status, renal function, and calcium intake.

Questions:

1. What health problems (direct and indirect) may arise from this water situation?
2. What sustainable activities/interventions could take place in order to improve this situation?
3. In addition to the presence of excess fluoride, what other problems may arise from the use of these hand pumps in Rajasthan?
4. What further questions would need to be asked in order to present a plausible intervention?
5. What stakeholders would need to be involved in order for these interventions to be successful?
6. What kind of management support would be needed for your suggested intervention (i.e monitoring and accountability)?

Stagnant water, uncontrolled sewage runoff, uncleared garbage, and clogged drains are a common occurrence throughout India, particularly around rural and urban slums. To qualify for municipal refuse collection does not guarantee removal (this is often the case in slum areas). Most of the refuse here was contributed by the truck stop/motel from where the picture was taken. Garbage was collected from the guest rooms and restaurant and tossed over the outside rail. These collections of water, feces, and debris often occur in areas frequented both by people and animals. The dirt you see in the foreground of the picture is a walking path for families making their way from one end of the field to the next.

Questions:

1. What potential health problems (direct and indirect) could arise from this situation?
2. As a public health official in the area, what are the first steps you would take to improve upon this situation?
3. Who would need to be involved? How would you ensure compliance and cooperation among these individuals?
4. At the government level, how might these problems creatively be approached?
5. At the grass roots levels, how might these problems creatively be approached?

The consumption of properly iodized salt at ≥15 ppm (parts per million) remains a persistent public health problem in the state of Rajasthan. Although this state is one of the three largest salt-producing areas in the country, only approximately 42% of the salt remains properly iodized. This means that three out of five children are not protected against the harmful effects of iodine deficiency including loss of IQ as well as the development of mental retardation. This photograph show two health professions using salt test kits in order to determine if the salt of this household is properly iodized. In conjunction with a lack of awareness around the importance of iodized salt, an additional barrier to consumption is the persistent mis-labeling of iodized salt in the market. Although many households are buying salt in the market that is labeled as properly iodized, upon testing, the salt is either not sufficiently iodized at 15 ppm or not iodized at all.

Questions:

1. What are some sustainable “first steps” that could be taken in order to address this public health situation both at the household level and at the distribution/marketing level?
2. How can consumer empowerment and demand be used to address this problem?
3. What further questions would need to be asked in order to present a plausible intervention?
4. What stakeholders would need to be involved in order for these interventions to be successful?
5. What kind of management support (if any) would be needed for your suggested intervention (i.e. monitoring and accountability)?

Sanitation is very closely linked to female literacy in India. The large number of girls in India who drop out of school, particularly around the time they reach Class 8, is often due to a lack of toilet and water facilities. Approximately 46% of schools in rural India lack toilet facilities and 17% lack water supply. This lack of facilities does not only affect female student attendance but also the attendance of female teachers.

Questions:

1. For those who do remain in schools without proper toilet and sufficient water facilities, what public health problems may arise?
2. What characteristics of the rural sector of a resource-poor country could compound the problem of insufficient facilities within schools?
3. What further questions would need to be asked in order to present a plausible intervention? What would this intervention be?
4. What stakeholder(s) would you involve in order for your intervention to be successful?

Sufficient groundwater is a rare commodity in many states throughout India. This water scarcity poses not only a public health risk but also an economic risk for a country where over 70% of the population makes a living around agriculture. Compounding this problem, is the presence of certain plants, for example Coca Cola's bottling plant, which extracts massive amounts of the country's groundwater source. Not only are large amounts of water extracted for use by these plants for a significantly reduced price provided by the government but the process of extraction also jeopardizes the quality of the water. Wells must be dug deeper increasing water contamination such as excess fluoride. Wastewater from this bottling plant is also discharged into the surrounding fields resulting in polluted soils and agricultural land.

Questions:

1. What health problems (direct and indirect) may arise from this water situation?
2. What sustainable activities/interventions could take place in order to improve this situation?
3. In addition to the presence of excess fluoride, what other health problems may arise from deep well digging?
4. What further questions would need to be asked before a plausible intervention is suggested?
5. What potential obstacles could you run across in dealing with this situation? How will you over come them?
6. What stakeholders would need to be involved in order for your intervention to be successful?
7. What kind of management support would be needed for your suggested intervention (i.e monitoring and accountability)?

The use of soap during hand washing remains a persistent problem throughout villages in India. Although many families will report usual hand washing before eating and after defecation, the substance most commonly used to wash hands is mud without the use of soap. This may be due to a variety of reason ranging from a lack of awareness around the importance of soap to the availability and cost of soap in local markets. The frequent co-habitation of families with animals and the frequent presence of animal feces within courtyards where children play also introduce concern around the lack of soap use.

Questions:

1. What potential health problems (direct and indirect) could arise from this situation?
2. As a public health official in the area, what are the first steps you would take to improve this situation?
3. What are the potential obstacles you could be faced with within rural communities and villages? Present a creative solution to the lack of affordable and available soap.
4. Who would need to be involved? How would you ensure compliance and cooperation among these individuals?
5. At the government level, how might these problems creatively be approached?
6. At the grass roots levels, how might these problems creatively be approached?
7. What kind of management support would be needed for your suggested intervention (i.e. monitoring and accountability)?
8. What stakeholders would need to be involved?


In India, most rural households do not contain toilet facilities with over 700 million people defecating in open fields. Even when toilet facilities are available, the field is the preferred place for defecation. “Open fields” often include along roadsides, in drains, in farmland, and in municipal parks. This poses two major public health problems: 1. Where the run-off is going, and 2. How one’s hands are washed after defecation.

Questions:

1. What potential health problems (direct and indirect) could arise from this situation?
2. As a public health official in the area, what are the first steps you would take to improve this situation?
3. What are the potential obstacles you could be faced with within rural communities and villages?
4. Present a creative solution that would take into account the traditional beliefs and long-established practices of those in the villages as well as address the public health problem that defecating in open fields presents?
5. Who would need to be involved? How would you ensure compliance and cooperation among these individuals?
6. At the government level, how might these problems creatively be approached?
7. At the grass roots levels, how might these problems creatively be approached?
8. What kind of management support would be needed for your suggested intervention (i.e monitoring and accountability)?

Due to persistent drought throughout certain states in India, untreated wastewater (not pictured here) is often times the only reliable source of irrigation water for farmers. It has been suggested that approximately 80% of wastewater (partially diluted or undiluted) is used to irrigate fields throughout India. It is used not only for its economic benefits but also as a coping strategy among the poor. The sale of this wastewater is also often times used by economically constrained families as a profitable income-generating activity.

Questions:

1. Who are the two different parties of people and the three different resources that are at risk in this irrigation activity?
2. What potential public health problems (direct and indirect) could arise from this situation?
3. As a public health official in the area, what are the first steps you would take to improve this situation?
4. What are the potential obstacles you could be faced with within rural communities and villages?
5. Who would need to be involved? How would you ensure compliance and cooperation among these individuals?
6. What kind of management support would be needed for your suggested intervention (i.e. monitoring and accountability)?
7. What stakeholders would need to be involved?

Public urination and defecation on street corners and adjacent to marketplaces along with open sewers are common occurrences in many major cities in India. Out of the approximately 4,500 cities in India, only about 235 have functioning sewer systems. Among the urban population, as few as 20% have septic tank toilets. The rapidly expanding population growth within India also adds to the sewage burden. For example, the sewers in Delhi were designed for a population of 3 million. Currently there are over 15 million people residing in the city of Delhi. This photograph shows men urinating behind one of the most crowded markets in the city of Jaipur. Although this part of the city actually supplies them with a specific place to go (most often this is not the case), the waste still runs off into the street draining into open streams and rivers whose water is used for many different purposes such as washing clothes and cooking pots. This situation becomes worse during the monsoon season when drains become clogged and water begins to inundate streets, markets, homes and stores.

Questions:

1. What potential health problems (direct and indirect) could arise from this situation?
2. As a public health official in the area, what are the first steps you would take to improve this situation?
3. What are the potential obstacles you could be faced with within cities? Present a creative solution that addresses the issues of appropriate, affordable, and culturally acceptable toilet facilities within cities.

4. Who would need to be involved? How would you ensure compliance and cooperation among these individuals?
5. At the government level, how might these problems creatively be approached?
6. What kind of management support would be needed for your suggested intervention (i.e. monitoring and accountability)?
7. What stakeholders would need to be involved?