

Problem Set 10

CEEG 340–Introduction to Environmental Engineering

Instructor: Deborah Sills

December 2, 2019

Due Date

5:00 PM, Monday, December 9

Problems

1. Calculate the DALYs associated with the following scenarios: All disability weights (except the one for stunting) were obtained from Salomon et al., 2015.
 - (a) The life expectancy in India is 68 years. Assume that a child contracts moderate diarrhea (disability weight of 0.202) at age 1, which lasts for 5 years. Assume that this child suffers from malnutrition and stunting which affects them for their entire life (disability weight of 0.1), which ends at the age of 68.
 - (b) A college student in the USA suffers from severe anxiety (disability weight of 0.52) for 4 years from the age of 18 to 22, followed by mild anxiety (disability weight of 0.13) for the rest of his life, which ends at the age of 65 in a car accident not linked to the anxiety disorder. For this scenario, calculate the DALYs associated with the anxiety disorder, assuming a life expectancy of 80 y.
2. **Unit conversions for concentrations of air pollutants**
Refer to pp.40–48 in the textbook.
 - (a) Textbook Problem 11.1
 - (b) Textbook Problem 11.4
 - (c) Textbook Problem 11.7
3. **Transportation Demand Management**
Refer to pp. 614-617 in the textbook.
 - (a) In one short paragraph, describe Transportation Demand Management. Choose two strategies from Table 11.17 in the text book that you think would be most effective at reducing vehicular emissions. Explain why you chose each strategy.
 - (b) Textbook Problem 11.13
4. **Air Pollution Treatment Technologies**
Refer to pp. 618–632 in the textbook.
 - (a) Textbook Problem 11.16

(b) Textbook Problem 11.17

5. **Assessment of Emissions**

Refer to pp.632–635 in the textbook and review your mass balance skills.

Textbook Problem 11.24

References

Salomon, J. A., Haagsma, J. A., Davis, A., de Noordhout, C. M., Polinder, S., Havelaar, A. H., & Murray, C. J. (2015). Disability weights for the Global Burden of Disease 2013 study. *The Lancet Global Health*, 3(11), pp.712-723.