

PART 2: ENVIRONMENTAL JUSTICE CASE STUDY: SEATTLE, WA¹

Lesson Plan 6: Environmental Justice Matters: Mapping Cumulative Impacts (Part 2)²

Goal: In order to make an environmental justice determination, participants will use a cumulative impacts method to quantify and confirm whether different parts of Seattle have disproportionate environmental burdens and benefits in some geographic areas relative to others.

Learning Objectives:

By the end of this lesson plan, participants will be able to:

- Explain a method for calculating cumulative impacts in Seattle
- Describe why ZIP code 98108 could be identified as a community with EJ concerns
- Discuss the root causes of environmental injustice
- Discuss ways to take action to collaborate with burdened communities to improve health

Materials:

- Maps from Lesson Plan 5
- Cumulative Health Impacts Analysis sheet (see below). Each group (five groups) will be assigned two ZIP codes to plug into a formula
- Blank map (Figure 1) for cumulative impacts coloring
- White board or butcher block paper

Time Required : 50-90 minutes (depending on extras)

Background: This lesson plan gives participants the opportunity to use a quantitative method to assess whether ZIP code 98108 can be considered a community with EJ concerns. The authors used an EPA cumulative impacts method to provide more concrete evidence that this area merits attention from decision-makers regarding health protective and proactive environmental regulations, policies, practices, and actions. Although it is well known that the City of Seattle has some areas that are disproportionately burdened by several environmental factors compared to others, there did not appear to be sufficient proof for action without more quantitative evidence.

Preparation for facilitators/teachers:

Gould, L., & Cummings, B.J. (March 2013). Duwamish Valley Cumulative Health Impacts Analysis. Seattle, WA: Just Health Action and Duwamish River Cleanup Coalition/Technical Advisory Group. <http://justhealthaction.org/wp-content/uploads/2013/03/Duwamish-Valley-Cumulative-Health-Impacts-Analysis-Seattle-WA.pdf>.

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Note: For the full report, a poster, and appendices go to:
<http://justhealthaction.org/resources/jha-publications/>.

Word Wall

- Indicator (Lesson Plan 1)
- Environmental Justice (Lesson Plan 2)
- Toxic (Lesson Plan 2)
- Equality/equity (Lesson Plan 3)
- Poverty level (Lesson Plan 5)
- 200% below federal poverty level (Lesson Plan 5)
- Built environment (Lesson Plan 5)
- Toxic Release Inventory site (Lesson Plan 5)
- Cumulative (Lesson Plan 5)
- Disproportionate (Lesson Plan 5)

Activity Instructions:

1. Revisit maps and vocabulary
Environmental Justice, cumulative, equity (see above)
2. Cumulative Impacts
 - a) Proving it
Prompt: Last time we looked at the maps, it appears that some neighborhoods (ZIP codes) are worse than others for many indicators. How would the community raise awareness about this inequity? What if a person, for instance, a City of Seattle council member who has influence to make change said something like: "These results don't seem very measurable. If you use more science to prove that this is a problem, I will do something about it." How would you propose to do this?
 - b) Cumulative Health Impact Analysis
Prompt: To give us a more concrete way of comparing these neighborhoods, we have a formula for finding the cumulative impact of these different factors. *Write the formula on the board (It's helpful to put up the maps next to the formula to show which maps are being used for each part of the equation).*

Cumulative impact = social vulnerability x environmental vulnerability

In this equation:

Social vulnerability = socioeconomic factors + sensitive populations

Environmental vulnerability =

environmental exposures + environmental effects + public health effects

- c) Cumulative Health Impact Analysis table
Hand out the Cumulative Health Impacts analysis table with blank rows (below). Assign each group one or two ZIP codes depending on the size of the class. Instruct the class how to use the formula to calculate the cumulative health

impact in their ZIP code (if some students finish early, have them fill out the rest of the matrix).

- d) Draw a large-scale matrix on the board or butcher block paper. Have students fill in their results on the board or butcher block paper for each ZIP code. Put the ZIP codes in order from highest number to lowest number. Which one(s) has the worst cumulative numbers? Which ones(s) have the best? (This cumulative analysis can be viewed on page 34, Table 3 at <http://justhealthaction.org/wp-content/uploads/2013/03/Duwamish-Valley-Cumulative-Health-Impacts-Analysis-Seattle-WA.pdf>).

- e) What would a colored map with the cumulative numbers look like? For example, what if you used the numbers you calculated in the table with highest numbers being dark brown and lowest numbers being a light brown, and you colored them into each ZIP code?

Note: if you have time, you can hand out blank Figure 1 map from Lesson Plan 5 (below) and have students color in the ZIP codes. They can then compare the cumulative map to the 15 maps that they colored in Lesson Plan 5. (This cumulative map can be viewed on page 35, Figure 17 at

<http://justhealthaction.org/wp-content/uploads/2013/03/Duwamish-Valley-Cumulative-Health-Impacts-Analysis-Seattle-WA.pdf>).

3. Discussion

- a) What does it mean to have qualitative (descriptive) versus quantitative (measureable) information about a subject?
- b) Why are these neighborhoods different? (See Lesson Plan 4: “Causes of the Causes” exercise).
- c) Burden of proof: Why does a community who has been disproportionately impacted have to prove they have more environmental burdens in order for a city, county or state to take action?

4. Action³ - How could action be taken at several levels to make things more equitable?

- a) What power does the community have to eliminate disparate environmental problems?
- b) What power does the city have to address these problems?
- c) What power does the county have to address these problems?
- d) What power does the state have to address these problems?

³Power Analysis - We do not provide a power analysis lesson plan here but there are ones available online. Here is one example: <http://www.racialequitytools.org/module/power-analysis>

Cumulative Health Impacts Analysis, by ZIP code, Seattle, Washington

Component	98XXX EXAMPLE	98108 Beacon Hill Georgetown South Park	98144 South Central District Mt Baker	98178 Rainier Beach	98106 White Center Delridge	98122 North Central District Madrona	98102 Eastlake	98107 Ballard	98105 University District Laurelhurst	98116 Alki	98199 Magnolia
Socioeconomic Factors	2	3	3	3	2	2	1	1	2	1	1
Sensitive Populations	3	3	3	3	2	1	1	2	1	2	2
<i>Social Vulnerability</i>	5										
Environmental Exposures	8	10	5	2	4	5	7	2	3	2	1
Environmental Effects	3	5	3	3	3	3	4	5	3	3	1
Public Health Effects	3	3	3	3	4	4	1	3	2	1	2
<i>Environmental Vulnerability</i>	14										
CUMULATIVE IMPACT SCORE	70										

Instructions: Fill in the blank spaces using the formula below in order to calculate the cumulative impact score for each ZIP code. See example in 2nd column

Cumulative Impact Score = Social vulnerability x Environmental vulnerability

Where:

Social vulnerability = socioeconomic factors + sensitive populations

Environmental Vulnerability = Environmental exposures + Environmental effects + Public health effects

Figure 1.
Seattle, Washington, 5 yr. Average 2006-2010

