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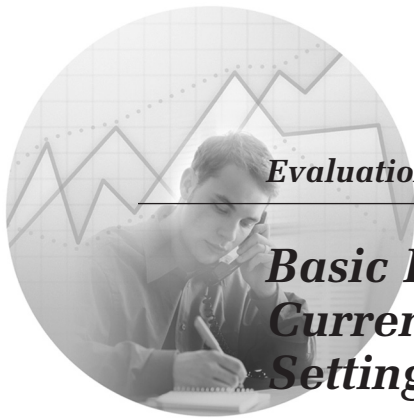
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Basic Priority Rating Model 2.0: Current Applications for Priority Setting in Health Promotion Practice

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Priority setting is an important component of systematic planning in health promotion and also factors into the development of a comprehensive evaluation plan. The basic priority rating (BPR) model was introduced more than 50 years ago and includes criteria that should be considered in any priority setting approach (i.e., use of predetermined criteria, standardized comparisons, and a rubric that controls bias). Although the BPR model has provided basic direction in priority setting, it does not represent the broad array of data currently available to decision makers. Elements in the model also give more weight to the impact of communicable diseases compared with chronic diseases. For these reasons, several modifications are recommended to improve the BPR model and to better assist health promotion practitioners in the priority setting process. The authors also suggest a new name, BPR 2.0, to represent this revised model.

Keywords: *health promotion; program planning and evaluation; community assessment*

to assess the comparative importance of health problems (diseases or injuries), social determinants, risk factors, interventions, and priority populations.

Priority setting is critical in narrowing the scope of activity to reflect the availability of resources within the context of stakeholders' values and preferences. In addition, priority setting helps health promotion practitioners stay focused on problems that actually affect the health status of a population. It is also an important component of the Centers for Disease Control and Prevention's (CDC, 1999) framework for program evaluation as Steps 2 and 3, "describing the program," and "focusing the evaluation design" respectively are both dependent on objective priority setting.

Subjective approaches for priority setting include simple voting procedures, forced rankings, and the nominal group process (Gilmore & Campbell, 2005). More objective but time-consuming methods include the Delphi method (Gilmore & Campbell, 2005) and the basic priority rating (BPR) or the Hanlon model (Hanlon & Pickett, 1984). At a

Priority setting should be a vital component of any health promotion systematic planning process. It can be included as the culminating phase of a needs assessment (McKenzie, Neiger, & Thackeray, 2009) or as an independent procedure

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minimum, a core goal of priority setting should be objective decision making by stakeholders. This requires the use of predetermined criteria, standardized comparisons, and the use of a rubric that minimizes bias. One model that incorporates these criteria and has a relatively long history of use in health settings is the BPR model.

Although the BPR model was introduced more than 50 years ago and has a long-standing history, certain elements in the model need clarification or modification to better maximize its use. Although the BPR model has been adequate to provide basic direction in priority setting, it does not reflect the broad array of data currently available to decision makers. Elements in the model also give more weight to communicable diseases compared with chronic diseases. The purpose of this article is to describe the latest published version of the BPR model (Hanlon & Pickett, 1984) and discuss revisions thereby improving the priority-setting process in general.

► **ORIGIN OF THE BASIC PRIORITY RATING MODEL**

A rudimentary form of what has since evolved into the BPR model was initially developed by John Hanlon (1954) in an attempt to prioritize health problems in developing countries. The model, originally called the “priority rating process,” was more formally presented by Hanlon throughout various editions of a textbook on public health administration. The latest version of the model was presented by Hanlon and Pickett (1984) in the eighth edition of the book. The term *basic priority rating* model was later created by Vilnius and Dandoy (1990, p. 464) to describe what Hanlon and Pickett called the summative formula in their model—the basic priority rating score. Although Vilnius and Dandoy did not propose any changes to the model, the revised name has endured. The BPR model is frequently cited as a viable method as evidenced by its inclusion in the Healthy People 2010 Tool Kit (Department of Health and Human Services, 1999) as a recommended strategy for priority setting.

The latest version of the BPR model (Hanlon & Pickett, 1984) was composed of four elements: (A) size of the problem (0-10 points); (B) seriousness of the problem (0-20 points); (C) effectiveness (0-10 points); and (D) PEARL (propriety, economics, acceptability, resources, and legality), which receives a score of either 0 or 1. After each health problem is scored with each of the four criteria, corresponding values are incorporated into the following equation for a total score:

$$\frac{(A + B)C}{3} \times D$$

Since the total score possible for any one health problem is 300, Hanlon and Pickett (1984) used a denominator of 3 to keep all scores within a range of 0 to 100. Since PEARL is a multiplier in the equation, a score of zero on any four of its subcomponents automatically removes the health problem from further consideration.

► **REVISED MODEL: BPR 2.0**

Using Hanlon and Pickett’s (1984) model as a reference point, we recommend the following modifications to allow stakeholders to use a broader array of available data sources and to make the model more applicable for both chronic and communicable disease priority setting. We also suggest a new name, BPR 2.0, to represent this revised model.

Size

The first criterion in the BPR model is (A) size. As described in an earlier version of the model by Hanlon (1969), the size of the problem involves the total number of people with the problem. Hanlon and Pickett (1984) later clarified that this involved incidence or prevalence rates depending on whether there was more interest in preventing occurrence or decreasing prevalence. The following type of scale was proposed to translate rates to scores:

<i>Incidence or Prevalence per 100,000 Population</i>	<i>Score</i>
≥150	10
125-149	8-9
100-124	6-7
75-99	4-5
50-74	2-3
0-49	0-1

In BPR 2.0, where incidence and/or prevalence data are not available through disease registries or surveillance systems, particularly in local communities, we recommend that age-adjusted cause-specific mortality rates and/or proportional mortality ratios be considered. These two measurements are easily calculated with data routinely reported by most state and local health departments and although they differ from incidence and

prevalence, they are both neutral measurements of size in general. For example, where cause-specific mortality rates provide a basic comparison of causes of death per 100,000 people and proportional mortality ratios describe how often people die from a specific health problem compared with all causes of death, neither type of data describes or qualifies the seriousness of the problem beyond its size.

Depending on availability of data and preferences of stakeholders, we further propose that one (or a combination) of the following options be used to score the size of the problem:

1. Use incidence **and** prevalence data and score each health problem on a scale of 0 to 5 for a total of 10 points (it is recognized that incidence represents a proportion of prevalence).
2. Use incidence **or** prevalence data and score each health problem on a scale of 0 to 10 points.
3. Use age-adjusted cause-specific mortality rates **and** proportional mortality ratios for each health problem and score each on a scale of 0 to 5 for a total of 10 points.
4. Use age-adjusted cause-specific mortality rates **or** proportional mortality ratios and score each health problem on a scale of 0 to 10 points.

Stakeholders may want to use a scale to translate mortality rates to scores similar to Hanlon and Pickett's scale for incidence and prevalence. The scale may need to be adjusted based on the data used.

Seriousness

The second criterion in the BPR model is (B) seriousness composed of four subcriteria: urgency, severity, economic loss, and impact on other people. Hanlon and Pickett (1984) acknowledged that these terms were subjective and that decision makers would need to agree on definitions. In addition, each subcriterion was scored on a scale of 0 to 10 even though the total score for the seriousness component was 20 points. In cases where scores exceeded 20 points, "they were to be truncated by the participants" (p. 198). For purposes of scoring consistency, we recommend that each of the seriousness scales be retained but scored on a scale of 0 to 5 points. We also recommend clearer definitions for each of the four subcriteria.

Urgency was originally defined as the emergent nature of the problem meaning the degree to which an emergency response was necessary to prevent or mitigate the spread of disease. This artificially inflated the significance of communicable diseases compared with chronic diseases. Therefore, we recommend that urgency be defined as the degree to which a health problem is increasing, stabilizing, or decreasing and that 5-year mortality trend data be used to score this subcriterion. Trend data is an appropriate indicator of a health problem's stability and is consistent with the new definition for urgency. Trend data should be translated to a score for urgency using the following scale: increasing trend data (5 or 4 points); stabilized trend data (2 or 3 points); and decreasing trend data (1 or 0 points).

Severity as defined by Hanlon and Pickett (1984) related most closely to lethality and used the case-fatality rate as its data element. The case fatality rate, however, is better suited to communicable diseases and should therefore be modified. Although associated disability was another original component of severity, it was usually considered only when the health problem was not considered fatal. We recommend that the severity criterion be expanded to include a range of options associated with the original intent of the criterion: (a) the lethality of a health problem, (b) premature mortality, and (c) disability. Five-year survival rates (or survivability) are an appropriate measure of lethality and better represent the impact of both communicable and chronic diseases. When using lethality, it is recommended that low survivability be associated with a lower score for severity thus focusing attention on problems related to more effective prevention or treatment outcomes. An inverse scoring strategy can also be applied (i.e., low survivability is scored higher on severity) when stakeholder preferences dictate that a more severe problem should be selected despite lower odds of survival. Years of potential life lost or years of productive life lost are appropriate measures of premature mortality. With respect to disability, DALYs (daily adjusted life years), or time lived with a disability and the time lost due to premature death, is a good indicator. Stakeholders must decide if severity will reflect lethality, premature mortality, or disability associated with the health problem or some combination of the three variables. Scoring should be adjusted accordingly on a 0- to 5-point scale (i.e., 5-4 is high, 3-2 is medium, and 1-0 is low).

Economic loss is the accumulation of costs borne by society associated with the health problem. Costs can be

TABLE 1
Data Elements Associated With Basic Priority Rating Criteria
and Scores for a National Cancer Priority Setting Exercise

Cancer Type	Size (A)	Seriousness (B)				Effectiveness of Interventions(C)
		Urgency ^{B1}	Severity ^{B2} (%)	Economic Costs ^{B3} (Billion \$)	Impact on Others ^{B4}	
Breast	120.4	Decreasing trend	89	13.8	High (+)	Effective interventions
Colorectal	45.5	Decreasing trend	65	12.1	High (-)	Promising interventions
Lung	65.6	Decreasing trend	16	10.3	High (-)	Promising interventions
Pancreas	11.6	Decreasing trend	6	1.8	Medium (-)	Emerging interventions
Prostate	156.9	Decreasing trend: less pronounced	100	9.8	Low (+)	Effective interventions

NOTE: A = based on incidence data per 100,000 (National Cancer Institute, 2010b); B1 = based on 5-year mortality trend data from 2000 to 2005 (National Cancer Institute, 2010b); B2 = based on 5-year relative survival rates (American Cancer Society, 2010); B3 = based on 2006 estimates of national expenditures for cancer care in billions of dollars (National Cancer Institute, 2010a); B4 = based on caregiving demands on family and friends related to degree of disability (scale = high, medium, and low with + or - indicating degree of strength); C = scores based on typology presented in Brownson, Fielding, and Maylahn (2009).

direct or indirect and can reflect additional subcategories, including annual, lifetime, and hospital costs, and so forth. Cost data are rarely available with consistency across year, subcategory, and health problems. Therefore, adequate discussion to check bias and ensure consistency is especially important for this subcriterion. The same type of scale as recommended for other subcriteria will be equally helpful here to translate data to scores (i.e., high = 5-4 points, medium = 3-2 points, and low = 1-0 points).

The final subcriterion for severity, *impact on others*, was defined by Hanlon and Pickett (1984) as the communicable nature of a health problem. We recommend an expansion of this definition to provide greater flexibility to stakeholders beyond the communicability of a disease. In this regard, planners may define impact on others in multiple ways: (a) as the communicable nature of the health problem (particularly when analyzing communicable diseases); (b) the behavioral effects related to the health problem on others (e.g., secondhand smoke, driving while under the influence of alcohol or other drugs, violence perpetrated on others, etc.); or (c) the emotional and physical impact the health problem (with attendant disabilities) has on others with respect to care giving. A translation scale is also recommended for this

subcriterion (i.e., high = 5-4 points, medium = 3-2 points, and low = 1-0 points).

Effectiveness of Interventions

This criterion was originally labeled “effectiveness.” We rename it here as effectiveness of interventions (C) as this has always been the intent of this criterion. Hanlon and Pickett (1984) included two elements in this criterion: reach and effectiveness. In BPR 2.0, reach is eliminated leaving evidence of successful interventions associated with the health problem as the sole criterion. Reach, response, and readiness are all vital elements of an implementation, communication, or broader marketing plan. However, they reflect characteristics of the priority population and are difficult to measure objectively.

The scientific literature must provide the basis for scoring this criterion. Sources such as the Guide to Community Preventive Services (CDC, 2010) or other resources pertaining to interventions targeting specific health problems (e.g., Cancer Control P.L.A.N.E.T.) are appropriate. To score this criterion we suggest using the typology developed by Brownson, Fielding, and Maylahn (2009). In this classification, scores ranging

TABLE 2
Basic Priority Rating (BPR) Table for a National Cancer Priority Setting Exercise

<i>Cancer Type</i>	<i>P</i>	<i>E</i>	<i>A</i>	<i>R</i>	<i>L</i>	<i>Size (A)</i>	<i>Seriousness^a (B)</i>	<i>Effectiveness of Interventions (C)</i>	<i>Total BPR Score</i>	<i>Rank</i>
Breast	1	1	1	1	1	7	1 + 4 + 5 + 5 = 15	8	58.6	2
Colorectal	1	1	1	1	1	1	1 + 3 + 5 + 4 = 13	6	28.0	3
Lung	1	1	1	1	1	3	1 + 1 + 4 + 4 = 10	6	26.0	4
Pancreas	1	1	1	1	1	0	1 + 0 + 1 + 3 = 5	3	5.0	5
Prostate	1	1	1	1	1	10	2 + 5 + 4 + 2 = 13	8	61.3	1

NOTE: A, B, C, and D refer to where they fit in the BPR formula. PEARL = D in the formula.
a. Scores presented in order of urgency, severity, economic costs, and impact on others.

from 9 to 10 reflect evidence-based interventions, scores of 7 to 8 reflect effective programs, scores of 5 to 6 reflect promising interventions, scores of 3 to 4 reflect emerging interventions, and scores of 0-2 reflect unproven interventions.

PEARL

The PEARL acronym (D) was best defined by Vilnius and Dandoy (1990) based on basic descriptions from Hanlon and Pickett (1984). As we are not recommending changes to PEARL, we refer the reader to the Vilnius and Dandoy article for a discussion of each of the four sub-criteria. However, earlier versions of the BPR model suggested that analysis of the PEARL criterion should occur after all data had been collected and translated to BPR scores. Since the function of PEARL is to determine whether stakeholders should proceed with or eliminate a health problem, this criterion should be analyzed prior to data collection and analysis.

► AN APPLICATION OF BASIC PRIORITY RATING 2.0

To provide an illustration of how BPR 2.0 might look in practice, the following hypothetical example related to priority setting for a national cancer program is presented. The authors served as stakeholders and made decisions based on data that were collected and analyzed.

Table 1 displays data elements necessary to assign scores for each of the BPR criteria and Table 2 displays scores translated from these data using scales described previously. In this example, each cancer type received

a score of 1 on the PEARL criterion (D) indicating there were no foreseeable community, programmatic, or jurisdictional problems associated with potential interventions.

Data related to the size of the problem were composed of incidence data and revealed that prostate cancer and breast cancer scored highest. Data related to the seriousness criterion were composed of 5-year mortality trend data (urgency), 5-year relative survival rates (severity), national expenditures for cancer care (economic costs), and perceived caregiving demands on family and friends related to the cancer type's associated degree of disability (impact on others). Breast cancer scored highest on the seriousness criterion followed closely by colorectal and prostate cancer.

A score for effectiveness of interventions was calculated by examining key risk factors for each cancer type then assessing the degree to which evidence-based interventions are available to address each risk factor. Ratings displayed in Table 1 and scores displayed in Table 2 were based on the typology presented in Brownson et al. (2009). Since, in this example the five cancer types share similar risk factors (i.e., diet, obesity, and smoking) the scores for this criterion were fairly similar. Breast and prostate cancer scored slightly higher compared with the other cancer types due mainly to the availability of effective preventive screening measures in addition to interventions aimed at improving health behaviors.

Total scores were calculated using the BPR equation described earlier. Prostate cancer and breast cancer surfaced as the first and second priorities, respectively. Technically, at this point, stakeholders would determine that prostate cancer should be their focus for program

development and implementation. But given the relative closeness of the top two scores, stakeholders could have further discussion to determine which of the two should become the priority. In some cases, a program budget may be able to accommodate two priorities.

► CONCLUSION

The BPR model was an innovative and useful approach to priority setting established more than 50 years ago. Limitations, such as difficulty in matching the priority setting values of stakeholders to the criteria in the model, ensuring that data are applied consistently across criteria, and reducing bias for criteria that are more subjective in nature (i.e., impact on others in the seriousness criterion as well as scoring interventions when evidence-based data are not available) require those who use the model to thoroughly scrutinize and discuss assigned scores.

We presented an updated model (BPR 2.0) that incorporates clearer definitions for scoring criteria and a broader range of data elements that reflect the importance of both chronic and communicable diseases. This allows stakeholders more flexibility in decision making while still reflecting characteristics that should be present in any objective priority-setting process.

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Erratum

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On page 168 of the March 2011 issue of *Health Promotion Practice*, “DALYs” is listed as “daily adjusted life years” and it should be “disability adjusted life years.”

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