

# **HONG KONG PUBLIC OPINION RESEARCH INSTITUTE (HKPORI)**

## **PUBLIC OPINION PROGRAM (POP)**

### **Post-Epidemic Normality Resumption Indexes (PENRI)**

#### **Explanatory Notes of 27 April 2020**

##### **1. Introduction**

As the coronavirus epidemic in Hong Kong subsides, people begin to discuss under what conditions should everyday life go back to normal, starting from one's work life then non-work life in the personal, family, community and societal domains.

While it may be the government's responsibility to decide what policies to take in helping society recover after the epidemic, we at the Hong Kong Public Opinion Program (POP) under the Hong Kong Public Opinion Research Institute (HKPORI) consider it important to gauge people's views in this aspect in a timely manner to facilitate rational deliberations in society based on scientific evidence.

On 21 April 2020, HKPORI launched a pilot index called "Post-Epidemic Work Resumption Index (PEWRI, 疫後復工指數)" with a set explanatory notes describing how to construct post-epidemic indexes to facilitate the resumption of normal life. After experimenting with a pilot design and collecting data non-stopped, POP has developed three more indexes with more sophisticated designs. They are grouped under the generic name of "Post-Epidemic Normality Resumption Indexes (PENRI, 疫後復常指數)" and more indexes would be developed in due course.

This paper describes how the four POP-PENRIs are constructed. HKPOP welcomes other researchers and institutes to construct their own PENRIs with different research designs. Here are the four POP-PENRIs as of 27 April 2020:

- 1) Post-Epidemic Work Resumption Index (PEWRI, 疫後復工指數)
- 2) Post-Epidemic School Resumption Index (PESRI, 疫後復課指數)
- 3) Post-Epidemic Gathering Resumption Index (PEGRI, 疫後復聚指數)
- 4) Post-Epidemic Public-Facilities Re-open Index" (PEPRI, 疫後公共設施重開指數)

POP intends to construct many more industry-based "Post-Epidemic Business Resumption Indexes" (PEBRIs, 疫後復業指數) to cover industries like beauty, catering, hospitality, tourism and film industries where evidence-based actions are urgently needed.

## **Conceptual Framework**

The main objective of PENRI is to find an “acceptable” level of risk whereby the public considers it reasonable to resume normal life after the epidemic. Using Hong Kong’s social hierarchy as the discussion framework, there can be “vertical” differences in risk perceptions and appraisals by government officials, health experts, economists, key opinion leaders, employers, employees, and so on, while on the “horizontal” level, different economic sectors, like white versus blue collars, primary versus secondary versus tertiary sectors, wholesale versus retail sectors, public versus private sectors, teachers versus parents versus students, and so on, may also have very different views. There can therefore be different PENRIs for different social groups in the social matrix, which can make the situation very complicated. HKPOP has avoided these complications by generating four sub-indexes for each index under the umbrella of PENRI using a 2x2 matrix of general-specific representation versus active-passive engagement, and then use a simple function to derive the value of the relevant index for each particular day. These would be explained step by step in this paper using the following nomenclature:

PENRI is the generic name of all indexes, where “N” stands for “normality”, unless otherwise stated, the values of all PENRIs are day-specific but some of them may be “provisional values” as stated

PEXRI is the variable name of a specific index, where “X” can be any plug-in abbreviation, like PEWRI for work resumption and PEWSRI for school resumption

PEXRI(sub-index) denotes the value of certain sub-indexes of the relevant index

PEXRI(item-value) denotes the percentage-value of people taking a certain item to be an acceptable standard for “normality resumption”, these values would be plugged into a function to derive the value of the PEXRI for any particular day

function  $\{PEXRI(sa) \cdot PEXRI(ga) \cdot PEXRI(sp) \cdot PEXRI(gp)\}$  is the general expression for a function which obtains the day-value of PEXRI by matching the real situation of a particular day to the corresponding item-values of all sub-indexes, for POP this function is defined simply as the mean of the relevant item-values of all sub-indexes, subject to operational rules to be explained later in this paper.

## **2. Research Design and Data Collection**

### **Opinion Questions**

Having considered all the pros and cons, the POP considers it good enough to use just one key opinion question to construct each PEXRI:

**Key question: When do you think is the appropriate time to resume “X” after the epidemic?** Answer options are arranged in gradation of “safety levels” like this in phase one of the operation:

- 1) Number of recovered cases exceeds newly confirmed cases each day
- 2) Number of newly confirmed cases each day falls to a single digit
- 3) No more newly confirmed local case
- 4) No more newly confirmed local or imported case
- 5) No more newly confirmed case in 7 consecutive days
- 6) No more newly confirmed case in 14 consecutive days
- 7) No more newly confirmed case in 28 consecutive days

When answering this question, those who choose a certain item is assumed to have agreed to all other items of higher safety levels, thus those who choose item 7 are taken to have agreed to all items 1~7, those who choose 6 are taken to have agreed to 1~6, and so on. The percentage-value of each answer item becomes the PEXRI(item-value) of the index. However, before plugging these values into the function which derives the value of the PEXRI for any particular day, the raw percentages have to be re-based to include definite answers only (thereby excluding “don’t know / hard to say” or other vague answers).

### Constructing PEXRI Sub-indexes

In terms of representation, there are two types of sub-indexes denoted by “g” (meaning “general”) and “s” (meaning “specific”), and in terms of engagement level, there are again two types of sub-indexes denoted by “a” (meaning “active”) and “p” (meaning “passive”). These relationship between these sub-indexes is best brought out by this 2x2 matrix:

$PEXRI = function ( PEXRI(sa) \cdot PEXRI(ga) \cdot PEXRI(sp) \cdot PEXRI(gp) )$			
	Active engagement		
Specific coverage	PEXRI(sa)	PEXRI(ga)	General coverage
	PEXRI(sp)	PEXRI(gp)	
	Passive engagement		

(s) denotes specific sector-based indexes generated from data collected from specific sectors of the population especially stakeholders like the working population, students, parents, practitioners and so on, as the case may be, meaning very focused coverage of specific target groups

(g) denotes general population-based indexes generated from data collected from the general population, meaning the widest coverage possible

(a) denotes active engagement indexes generated from data collected from voluntary submissions from the general population or specific sectors as the case may be, representing a high level of civil engagement if the number of submissions is big but may not be representative if there are participation biases

(p) denotes passive engagement indexes generated from data collected from random sample surveys of the general population or specific sectors as the case may be, they may be more representativeness if the sample size is big enough, but they represent a much lower level of civil engagement

(s)(g)(a)(p) can be combined in a variety of way to produce more sub-indexes, and in this document the following nomenclature is used: (s) denotes (sa) and (sp) aggregated, (g) denotes (ga) and (gp) aggregated

Data requirements

Because the validity and usefulness of all indexes are affected by their research method, sampling size, number of submissions, timeliness and other considerations, POP’s recommendations for the counting base of various sub-indexes are given in the following diagram, with “N” denoting the sample size of random surveys or number of opt-in voluntary submissions, as the case may be, before any re-basing:

Data Requirements for PEXRI sub-indexes in terms of N			
	Active engagement		
Specific coverage	PEXRI(sa) N=1000+	PEXRI(ga) N=2000+	General coverage
	PEXRI(sp) N=500+	PEXRI(gp) N=1000+	
	Passive engagement		

In the diagram, “N” refers to the counting base of each sub-index POP adopts a rolling design whereby data comes in everyday. To maintain data freshness and thus the timeliness of all PENRIs, POP would aggregate the daily data backward day by day up to the point when N is fulfilled for different categories. The data period for each sub-index may therefore be slightly

different. If and when a sector-based sub-index does not have enough count, POP would step up its promotion to invite more people to make submissions related to that sector.

### Computations

When computing the PEXRI(item-value), we would first aggregate the various item-values of PEXRI(sa) with those of PEXRI(sp) to produce a set of item-values for PEXRI(s). We then aggregate the various item-values of PEXRI(ga) with those of PEXRI(gp) to produce a set of item-values for PEXRI(g). Finally, we aggregate the various item-values of PEXRI(s) with those of PEXRI(g) to produce a set of item-values for PEXRI. In case where a PEXRI does not have an “s” component (like PEGRI) because their stakeholders is the general population itself, we would set PEXRI(sa) = PEXRI(ga) and PEXRI(sp) = PEXRI(gp). In the course of constructing new indexes, the following rules would apply:

- 1) If any one of PEXRI(sa), PEXRI(sp), PEXRI(ga) and PEXRI(gp) fails to reach the required N, it would be dropped from the calculation of PEXRI(s) and PEXRI(g), meaning that the item-values of the missing sub-index will take on those of the other one in the same family (in terms of engagement level) so that aggregate sub-indexes PEXRI(s) and PEXRI(g) can be constructed.
- 2) If either PEXRI(s) or PEXRI(g) cannot be constructed due to problems with N (like both sub-indexes of the same family fail to reach N), the item-values of the missing sub-index will take on those of the other one (which has fulfilled N) so that an aggregate index PEXRI can be constructed.
- 3) If both PEXRI(s) and PEXRI(g) cannot be computed, the index should not be launched until at least one of the 4 sub-indexes reaches its N requirement.
- 4) In case some PEXRI item values are lagging behind due to data processing, provisional values can be used before the final values are available, with clear explanations.

### **3. Latest Findings**

After conducted a pilot study from 7 April to 20 April 2020 to construct the PEWRI (on work resumption), POP proceeded to construct three more indexes using an enhanced design. This section reports the latest results of POP’s PEWRI, PESRI (on school resumption), PEGRI (on gathering resumption) and PEPRI (on public-facilities re-opening). We start with a table which summarizes the indexes along with factual records of the epidemic onto which appropriate “item-values” of each index are mapped:

<b>Date</b>	<b>Real Situation (the previous day)</b>	<b>PEWRI</b>	<b>PESRI</b>	<b>PEGRI</b>	<b>PEPRI</b>
22/4/2020	4 imported cases	31.6	16.1	27.6	21.6
23/4/2020	4 imported cases	29.9	16.3	27.2	21.6
24/4/2020	2 imported cases	29.4	18.0	28.9	21.2
25/4/2020	0 confirmed case	35.4	22.3	40.9	29.6
26/4/2020	2 imported cases	28.3	18.6	32.4	25.8
27/4/2020	0 confirmed case	33.5	21.1	40.2	30.1

Here is a table which gives the “item-values” of all indexes:

<b>PEWRI: When do you think is the appropriate time to resume normal work after the epidemic?</b> (after aggregating four sub-indexes)						
<b>22/4</b>	<b>23/4</b>	<b>24/4</b>	<b>25/4</b>	<b>26/4</b>	<b>27/4</b>	<b>Labels</b>
12,783	10,960	5,561	6,024	6,379	6,543	N (total sample size or number of submissions)
1.9	1.5	1.3	1.3	1.3	1.3	Number of recovered cases exceeds newly confirmed cases each day
17.7	17.7	18.6	18.3	16.6	16.7	Number of newly confirmed cases each day falls to a single digit
<b>31.6</b>	<b>29.9</b>	<b>29.4</b>	29.9	<b>28.3</b>	28.1	No more newly confirmed local case
36.6	35.4	34.2	<b>35.4</b>	33.6	<b>33.5</b>	No more newly confirmed local or imported case
43.7	44.5	42.6	44.6	43.3	42.8	No more newly confirmed case in 7 consecutive days
76.3	75.3	74.9	76.0	75.1	75.5	No more newly confirmed case in 14 consecutive days
100.0	100.0	100.0	100.0	100.0	100.0	No more newly confirmed case in 28 consecutive days
<b>PESRI: When do you think is the appropriate time to resume schooling after the epidemic?</b> (after aggregating four sub-indexes)						
<b>22/4</b>	<b>23/4</b>	<b>24/4</b>	<b>25/4</b>	<b>26/4</b>	<b>27/4</b>	<b>Labels</b>
6,516	8,119	2,238	2,513	2,707	2,797	N (total sample size or number of submissions)
0.8	0.7	0.0	0.1	0.1	0.1	Number of recovered cases exceeds newly confirmed cases each day
4.2	4.6	6.8	7.5	6.8	7.1	Number of newly confirmed cases each day falls to a single digit
<b>16.1</b>	<b>16.3</b>	<b>18.0</b>	18.9	<b>18.6</b>	18.2	No more newly confirmed local case
20.4	20.9	22.7	<b>22.3</b>	21.5	<b>21.1</b>	No more newly confirmed local or imported case
25.6	26.8	31.8	31.7	31.7	31.1	No more newly confirmed case in 7 consecutive days
53.8	54.0	56.6	57.7	57.5	56.6	No more newly confirmed case in 14 consecutive days
100.0	100.0	100.0	100.0	100.0	100.0	No more newly confirmed case in 28 consecutive days
<b>PEGRI: When do you think is the appropriate time to resume normal gathering after the epidemic?</b> (after aggregating four sub-indexes)						
<b>22/4</b>	<b>23/4</b>	<b>24/4</b>	<b>25/4</b>	<b>26/4</b>	<b>27/4</b>	<b>Labels</b>
6,511	8,114	2,237	2,513	2,708	2,798	N (total sample size or number of submissions)
0.9	0.9	0.2	0.2	0.3	0.3	Number of recovered cases exceeds newly confirmed cases each day
14.5	14.5	14.3	15.7	15.9	16.2	Number of newly confirmed cases each day falls to a single digit
<b>27.6</b>	<b>27.2</b>	<b>28.9</b>	31.8	<b>32.4</b>	31.6	No more newly confirmed local case
33.3	34.0	40.0	<b>40.9</b>	41.0	<b>40.2</b>	No more newly confirmed local or imported case
44.4	46.7	61.7	59.4	60.8	61.8	No more newly confirmed case in 7 consecutive days
78.8	79.1	84.0	88.1	87.0	87.3	No more newly confirmed case in 14 consecutive days
100.0	100.0	100.0	100.0	100.0	100.0	No more newly confirmed case in 28 consecutive days

<b>PEPRI: When do you think is the appropriate time to re-open public leisure and sports facilities after the epidemic?</b> (after aggregating four sub-indexes)						
<b>22/4</b>	<b>23/4</b>	<b>24/4</b>	<b>25/4</b>	<b>26/4</b>	<b>27/4</b>	<b>Labels</b>
6,518	8,119	2,235	2,511	2,705	2,795	N (total sample size or number of submissions)
1.1	1.0	0.1	0.2	0.2	0.2	Number of recovered cases exceeds newly confirmed cases each day
11.4	11.5	9.4	10.1	10.1	10.2	Number of newly confirmed cases each day falls to a single digit
<b>21.6</b>	<b>21.6</b>	<b>21.2</b>	24.2	<b>25.8</b>	25.0	No more newly confirmed local case
25.8	26.4	28.7	<b>29.6</b>	30.9	<b>30.1</b>	No more newly confirmed local or imported case
37.9	38.7	42.6	44.1	44.0	43.8	No more newly confirmed case in 7 consecutive days
72.0	71.9	72.1	76.2	76.3	75.0	No more newly confirmed case in 14 consecutive days
100.0	100.0	100.0	100.0	100.0	100.0	No more newly confirmed case in 28 consecutive days

#### **4. Conclusion and Recommendation**

Hong Kong registered zero case of infection on 20 April after many months of epidemic. It so happened that we at HKPOP also released our PENRI pilot findings on 21 April. Having constructed four indexes, we can see that according to public opinion, different pace should be taken in different aspects regarding the resumption of normal life. People appear to want a much quicker pace to resume social gathering, then resume working as normal. However, regarding the reopening of schools and public facilities, a much slower pace is considered desirable. As of today, 27 April, no index has reached the level of 50 marks, so people are in general not in a hurry to resume normal life in all four aspects.

#### **Notes of caution**

- (a) All PENRIs are indices based on public perception which itself may be subjective and irrational but is nevertheless an important part of social reality.
- (b) The key expression in PENRI surveys is “normal life” in various aspects, but exactly what constitutes “normality” is open to interpretation. It can be argued that wearing masks at work or during commutation may be seen as “not yet normal”. Even flexi-hour work and/or service arrangements may be seen as “not normal”. In this paper, it is assumed that the main difference between “normal” and “not normal” is the existence of government bans on certain commercial activities and the closure of certain public facilities. If and when needed, the wording of PENRI questions can be refined to pin down the meaning of “normality”.