Assessing Leadership Among WHO's Directors-General

by Jonathan M. Cohen

Can leadership practices, education, and background experiences predict the effectiveness and success of a World Health Organization (WHO) Director-General (DG), or any other leader of an organization, during a regional or global healthcare crisis? There are studies which examine international organizations and their accomplishments or missteps during their leaders' tenures. Other studies examine organizational performance, and rated their improvements or declines based on the leadership of the individual in charge. Few studies, however, examined a leader's background and how it may have impacted organizational performance.

Leadership is an integral part of any organization's success. Literature on this topic has addressed leadership theories, principles, attributes, and characteristics and other studies assessed individual leadership during a crisis; however, leadership scholars rarely apply these theories, principles, attributes, and characteristics to an individual or group of people to determine why leaders either succeeded or failed; this article examines the nine WHO DG's leadership during international healthcare crises.

Background

During their tenures, all of the WHO DGs faced at least one regional or global health crisis that tested their leadership within the WHO and among the states of the international community. The first WHO DG, Dr. George "Brock" Chisholm and the newly formed WHO responded to health crises as a result of the devastation of the Second World War which included a cholera outbreak in Egypt as well as widespread malaria in Greece and Sardinia.[1]

Dr. Marcolino Gomes Candau led the WHO through a H2N2 influenza outbreak in 1957,

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a major cholera pandemic that originated in Indonesia in 1961, and an H3N2 influenza outbreak in 1968.[2] Dr. Halfdan Mahler led the WHO in 1981 when a never before seen virus, the human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), emerged on the African continent and reached epic proportions.[3] Dr. Hiroshi Nakajima and the WHO responded to what he referred to as a "global tuberculosis emergency" in 1994.[4] Dr. Gro Harlem Brundtland and her successor, Dr. Jong-Wook Lee, led the WHO in 2002 and 2003 when the severe acute respiratory syndrome (SARS) virus broke out in China and spread to nearly 24 countries.[5,6]

After the sudden death of Dr. Lee in 2006, Dr. Anders Nordström became the interim DG of the WHO. He not only had to keep the WHO running until a special election could be organized, he continued to lead the organization and guided its response to the H5N1 avian influenza crisis.[7] In 2009, Dr. Margaret Chan was head of the WHO during a H1N1 influenza outbreak in Mexico and the United States. Additionally, she guided the organization through a Middle East respiratory syndrome (MERS) corona virus in 2012, oversaw the WHO response to the ebola pandemic in 2014, which started in West Africa, and the zika virus outbreak, which originated in Brazil.[8] Finally, Dr. Tedros Adhanom Ghebreyesus became the WHO DG in 2017 and two years later led the organization during the COVID-19 virus outbreak that originated in China and spread around the globe in just a few short months.[9]

Identifying the presence (or absence) of exemplary leadership practices, experiences, and training can explain why some WHO DGs were more successful than others. By codifying the practices of exemplary leadership of potential candidates for leadership and managerial positions, institutions can better prepare incoming personnel to become better leaders and managers before assuming the responsibilities of leading organizations. Training plans can also be developed to ensure future WHO DGs (or any other leader of an organization) will be prepared for success before assuming a position.

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This type of research is important. All nine WHO DGs faced regional or global health challenges during their tenures and had varying degrees of success. Some were severely criticized for their less-than-successful outcomes. All of the WHO DGs were accomplished enough to have reached what many might consider the pinnacle of a medical or public health career—to be selected as the WHO DG. This article demonstrates why several of the WHO DGs were more successful than others. Diverse experiences and training outside "standard" medical backgrounds attributed to the success of some of the DGs. These diverse experiences and training included high level state and international medical positions as well as political experiences outside the medical field. Research conducted through leadership and managerial lenses can identify these broadening and diverse experiences, codify them, and they can be required for personnel selected for leadership positions such as the leader of the WHO or can be used by candidates vying for leadership and managerial positions to identify their own weaknesses and better prepare themselves for these types of billets.

Requiring personnel who desire, or are designated, to become international organizational leaders to hold certain types of positions and/or attend executive-level management training may not guarantee their success. However, at the very least, these developmental positions and training sessions can prepare and provide them with opportunities to be successful.

Methodology

This study assessed WHO DGs to determine their level of leadership success during their tenures by exploring the presence or absence of the Kouzes and Posner's *Practices of Exemplary Leadership* as well as examining their backgrounds for diverse experiences and educational opportunities, which can provide an explanation for their successes or failures.[10] Recommendations for various experiences and training needed can ensure future WHO DGs will have conditions set for success prior to assuming this leadership and managerial position.

Two dependent variables were developed for this study. The first was experience and education level (*ExEd*). The independent variables used to develop the experience and education level dependent variable included non-medical political experience (*PE*), previous state or international medical public office experience (*PPOE*), previous WHO experience (*WE*), medical experience (*MEx*), education supporting public office (*ESPO*), and medical education (*ME*); all of these independent variables were measured in years. The experience and education level dependent variable was expressed as:

$$ExEd\ (y_2) = ME\ (x_1) + MEx\ (x_2) + ESPO\ (x_3) + PPOE\ (x_4) + WE\ (x_5) + PE\ (x_6).$$

The second dependent variable was demonstration of the five practices of exemplary leadership (*D5PEL*). Defined in Table 1, the independent variables used to develop the Demonstration of the five practices of exemplary leadership were Kouzes and Posner's practices of exemplary leadership, which included model the way (*MtW*), inspire a shared vision (*ISV*), enabled others to act (*EoA*), challenge the process (*CtP*), and encourage the heart (*EtH*).[11]

These independent variables were measured through a qualitative research process known as "coding." The program used to code these variables is call NVivo. This program allows a researcher to track and organize passages, phrases, and key words in source documents and enables a researcher to develop variables, charts, and graphs to express the data collected. The demonstration of the five practices of exemplary leadership dependent variable was expressed as:

$$D5PEL\ (y_1) = MtW\ (x_1) + ISV\ (x_2) + CtP\ (x_3) + EOtA\ (x_4) + EtH\ (x_5).$$

Once the experience and education level and demonstration of the five practices of exemplary leadership dependent variables were developed for each WHO DG, they were added together and an overall leadership success assessment (*OLSA*) score was developed for each DG, which

Model the Way	Clarify values by finding a voice and affirming shared values.
	Set the example by aligning actions with shared values.
Inspire a Shared Vision	Envision the future by imagining exciting and ennobling possibilities.
	Enlist others in a common vision by appealing to shared aspirations.
Challenge the Process	Search for opportunities by seizing the initiative and looking outward for innovative ways to improve.
	Experiment and take risks by consistently generating small wins and learning from experience.
Enable Others to Act	Foster collaboration by building trust and facilitating relationships.
	Strengthen others by increasing self-determination and developing competence.
Encourage the Heart	Recognize contributions by showing appreciation for individual excellence.
	Celebrate values and victories, creating a spirit of community.

Table 1. Kouzes and Posner's Five Practices of Exemplary Leadership[12]

	Crisis Relative Values		Crisis Raw Data		Non-Crisis Relative Values		Non-Crisis Raw Data		Experience Type		
	Rank	Group	Rank	Group	Rank	Group	Rank	Group	PE	PPOE	WE
Chisholm	1	T5	6	B4	4	T5	9	B4		✓	
Candau	2	T5	5	T5	1	T5	8	B4		✓	✓
Mahler	8	B4	9	B4	9	B4	2	T5			✓
Nakajima	7	B4	7	B4	3	T5	5	T5			✓
Brundtland	2	T5	3	T5	1	T5	3	T5	✓	✓	
Lee	4	T5	4	T5	7	B4	7	B4			✓
Nordstron	9	B4	8	B4	8	B4	6	B4			✓
Chan	5	T5	1	T5	5	T5	4	T5		✓	✓
Ghebreyesus	5	T5	2	T5	5	T5	1	T5	✓	✓	

Table 2. Overall leadership assessment ranks for WHO Director General

enabled them to be rank ordered and placed in either the top five of the group or the bottom four of the group. Based on the data collected, a determination was made as to why the top five WHO DGs were more successful than the bottom four. The Overall Leadership Success Assessment was expressed as:

$$OLSA = D5PEL\ (y_1) + ExEd\ (y_2).$$

Research for this study was conducted by searching the WHO's international repository for information sharing (IRIS) and the United Nations' Digital Library System as well as other databases and websites for sources to code; approximately 200 sources were collected and used. After gathering the sources and coding them, the analysis of the data was conducted including weighting the experience and education and exemplary leadership practice variables. The overall leadership success assessment data was analyzed from multiple perspectives. These perspectives included relative values and raw data overall leadership success assessments in crisis and non-crisis scenarios. The results of these assessments allowed for the comparison and contrast of the DGs as a group and provided plausible explanations as to why some of the DGs had better scores than others and why some DGs were in the top five of the group and why others where in the bottom four of the group.

This study, and its results, show that WHO DGs that have more diverse and extensive backgrounds and experiences demonstrated the five practices of exemplary leadership more frequently and at higher levels than those with less diverse backgrounds; specifically, those DGs that had political experiences outside the medical field and/or held previous state or international medical positions demonstrated the five practices of exemplary leadership more frequently in day-to-day operations and during healthcare crises than those DGs who did not have these types of experiences. Table 2 reflects the results of the four assessments that were conducted—crisis relative values, crisis raw data, non-crisis relative value, non-crisis raw data. Additionally, each DG's ranking for each factor is reflected in the rank columns. The group columns indicate whether the WHO DG finished in the top five (T5) of the group or the bottom four (B4) of the group in each assessment. The experience columns on the right whether or not the DG had non-medical political experience (*PE*), previous medical public office experience (*PPOE*), or WHO experience (*WE*).

Assessment of WHO Directors General

Dr. Chisholm

Dr. Chisolm did not have political experience but did hold public office for two years. Within the relative values assessment for crisis situations and non-crisis situations, he was a top five WHO DG; however, in the two raw data assessments, he was ranked in the bottom four of the group. He had no political experience but did hold a public office for two years, which provided little assistance to his assessments. During crises, in the variable model the way, he only demonstrated this practice of exemplary leadership 15.00% of the time while the average was 28.51% among the DGs. His inspire a shared vision variable was demonstrated 23.13% of the time in crisis, which was the third highest in crisis and 35.71% of the time in non-crisis, which was the highest demonstrated in that assessment. However, the use of these practices of exemplary leadership were not enough to overcome the low coverage of the model the way variable described earlier. Although he had nineteen years of medical experience, since he was the first WHO DG, there was no possibility of him having previous WHO experience. All of these factors kept Dr. Chisholm in the lower half of the group in two of the four assessments.

Dr. Candau

Dr. Candua did not have political experience but did hold public office for twelve years. He consistently was rated in the top five of the WHO DGs in all assessments except in the raw data non-crisis overall leadership success assessments. His coverage percentages in crisis situations of most the practices of exemplary leadership were consistently in the top five during crises and included enabled others to act (43.35%, which was rated first) and inspire a shared vision (19.74%, which was rated fifth); however, he was rated second to last in model the way (17.17%). His experience and education level levels also enabled him to stay in the top half of the group. Dr. Candau had twelve years of previous medical public office experience , which was the second most of the DGs who held medical public office positions. His experience and education level levels were ranked first in relative values and in the top five in raw data.

In the raw values non-crisis overall leadership assessment, his total number of sources and instances in which he displayed the practices of exemplary leadership were much less than the other DGs and this more than likely accounts for the skewed results against him in this assessment. In the raw values crisis overall leadership success assessment, Dr. Candau did have the most uses of the variable of enabled others to act (111). Dr. Candau's high experience and education level Levels (rated first in both relative values, and in the top five in both raw data) and his high demonstration of the variables of enabled others to act and challenge the process in crisis and non-crisis situations, ensured he would rank in the top five of DGs in three of the four overall leadership success assessments.

Dr. Mahler

Dr. Mahler did not have political experience or hold public office. His rankings were consistently in the bottom four of the group in all assessments except the raw values non-crisis overall leadership success assessments where he was ranked second. A possible reason for this is that during his fifteen years as the WHO DG, there were no major regional or global healthcare crises until the last years of his tenure when HIV/AIDS began to appear. In crisis, Dr. Mahler demonstrated several of the practices of exemplary leadership well to include challenge the process (ranked first at 15.38%), enabled others to act (ranked third at 32.32%), and model the way (ranked fourth at 32.31%). On the other hand, he was in the bottom four of the group when demonstrating the variable of inspire a

shared vision (ranked eighth with 18.46%) and encourage the heart (ranked last with 1.54%); Dr. Mahler held no previous public office and had no political experience which also kept his rankings down, but he did have twenty-two years of previous WHO experience.

As previously stated above, the majority of Dr. Mahler's tenure as the WHO DG was not in crisis. Of the twenty sources examined, thirteen were in non-crisis situations and seven were during crises which explains his lower rankings in crisis assessments and accounts for his top five ranking in the raw values, non-crisis overall leadership success assessment.

Dr. Nakajima

Dr. Nakajima's neither had political experience nor hold public office. Half of Dr. Nakajima's overall leadership assessments (all non-crisis assessments) were in the top five of the group. Like Dr. Mahler, Dr. Nakajima spent many years at the WHO before being selected as the DG (sixteen years) and had no public office or political experience. While his practices of exemplary leadership coverages in crisis were generally in the bottom half of the group, he did have the second highest challenge the process percentage (14.95%) and his model the way variable percentage was in the top five (28.97%). Dr. Nakajima's coverage in the inspire a shared vision variable was 18.69%, which ranked seventh, can explain why his rankings were low in crisis.

Dr. Nakajima's relative values and raw data, non-crisis overall leadership success assessments were in the top five of the group. His overall practices of exemplary leadership tally count in this category was ranked fourth. Additionally, of the twenty sources found for Dr. Nakajima, ten covered non-crisis situations which accounts for the top five rating in this assessment.

Dr. Brundtland

Dr. Brundtland had sixteen years of political experience and held public office for six years. Brundtland was a top five DG in all overall leadership success assessments. In crisis, she had the highest score in the inspire a shared vision variable from the practices of exemplary leadership. She had a 24.51% coverage and the average among the DGs was 20.26%. In non-crisis situations, this variable was rated in the top five of DGs as well.

Dr. Brundtland's experience and education level levels also enabled her to remain in the top five of the DGs in all overall assessments. She held political office for sixteen years and public office for six years, and certainly enabled her to be in the top five of the WHO DGs and definitely supports the hypothesis. Finally, of the twenty sources used to assess Dr. Brundtland, thirteen dealt with crisis and seven covered non-crisis situations.

Dr. Lee

Dr. Lee did not have political experience and did not hold public office. Similar to, but opposite of Dr. Nakajima, two of Dr. Lee's assessments (all crisis assessments) were in the top five of the group. Like Dr. Nakajima, Dr. Lee did not have political experience or hold public office (he did have twenty-five years of WHO Experience), yet he was still ranked in the top five of the group in the two crisis overall leadership assessments. His high ranking is explained by the fact that he demonstrated the practices of exemplary leadership in crisis often and frequently during his three years at the helm of the organization.

His coverage in the model the way variable was second overall (33.45% and the group average was 28.51%) and he was third overall in the variable of inspire a shared vision (21.45% and the group average was 20.26%). He also was in the top five of the group in the variable enabled others to act; his regular demonstration of the variables elevated him into the top five of the WHO DGs during crisis situations. Additionally,

with his scores and rankings improving from non-crisis to crisis situations; he showed that his leadership improved when crises occurred.

Dr. Nordström

Dr. Nordström did not have any political experience and did not hold public office. All of his overall leadership assessments were in the bottom four of the group for all assessments; however, these results are more than likely not a true assessment of his leadership abilities. He only served as the interim DG for seven months.

When searching the IRIS and other databases, only fourteen sources (five crisis and nine non-crisis) were found covering his time as the WHO interim DG (since 2007, Dr. Nordström has been widely published). The lack of sources definitely contributed to his bottom four rankings and these rankings were not a true indication of the type of leader Dr. Nordström was.

When looking at his demonstrated coverages of the practices of exemplary leadership in crisis, he was ranked first in the model the way variable (41.89% and the group average was 28.51%). However, he was ranked last in inspire a shared vision variable (17.57% and the group average was 20.26%) and enabled others to act variables. He also was ranked eighth in challenge the process variable.

As noted, he did not hold public office or have political experience; however, during his seven-month tenure as the interim WHO DG, he knew he would not be competing for the WHO DG position and had already accepted a new position outside the organization—the DG position at the Swedish International Development Agency. His charge was to keep the organization running until a new WHO DG could be selected and, by all accounts, he did an excellent job doing just that.

Dr. Chan

Dr. Chan did not have political experience, but did hold public office for eleven years. She was in the top five in all four of the overall leadership success assessments. Her demonstration of the practices of exemplary leadership during crises had her ranked third in the model the way variable (33.02% and the group average was 28.51%) and she was also ranked second in the encourage the heart variable; however, she ranked in the bottom four of the group during crisis in inspire a shared vision, enabled others to act, and encourage the heart variables. While these scores were not in the top five, her experience and education level levels did help raise her rankings. She had eleven years of public office experience (the third highest total in the group).

Additionally, twenty-six sources (nineteen crisis and seven non-crisis) were found on Dr. Chan whereas most of the other DGs had twenty or less. In the nineteen crisis sources, her high model the way and inspire a shared vision variable scores, and her public office held enabled her to be a top five DG in all assessments, which supports the hypothesis. Finally, examining her raw data tally totals, she did have twenty-nine more instances of demonstrating the model the way variable than all other DGs to include Dr. Ghebreyesus who had thirty-six total sources.

Dr. Ghebreyesus

Dr. Ghebreyesus did have five years of political experience and did hold public office for twenty-eight years. Like Dr. Chan, Dr. Ghebreyesus finished in the top five in all four of the overall leadership assessments. In crisis, he was ranked fourth overall among DGs in the inspire a shared vision (23.56% and the group average was 20.26%) and enabled others to act in the practices of exemplary leadership; additionally, he ranked first in the encourage the heart variable. He did rank in the bottom four of the group in the model the way variable of the practices of exemplary leadership. His

experience and education level levels definitely influenced his rankings because he had the second most years of political experience and he held various public offices totaling twenty-eight years, which supports the hypothesis.

As previously noted, the number of sources available for the Dr. Ghebreyesus analysis and assessment far exceeded any of the other WHO DGs (thirty-six versus Dr. Chan – twenty-six, the other DGs averaging about twenty, and with Dr. Nordström only having fourteen), which gave him a clear advantage in all of the raw data assessments.

Analysis

The majority of the WHO DGs that had political experience and/or previous public office experience had three or more top five assessments (Drs. Candau – three, Brundtland – four, Chan – four, and Ghebreyesus – four); however, while Dr. Chisholm did have previous public office experience, he only had two top five assessments. A possible reason was that Dr. Chisholm displayed the exemplary leadership practice/variable of model the way 14.19% of the time while the average among the other DGs was 28.51%. While this low rating effected his overall assessments, his inspire a shared vision variable was demonstrated 22.58% of the time in crisis (ranked third in crisis), and 33.33% of the time in non-crisis which was the highest demonstrated in those assessment. The use of these practices of exemplary leadership was not enough to overcome the low coverage of the model the way variable described earlier.

Dr. Jong-Wook Lee did not have any political experience or hold previous public office but did have two assessments (all crisis) in the top five of the group. Dr. Lee's case did challenge the study's hypothesis. While Dr. Lee had no public office or political experience, he did have two-and-a-half decades of WHO experience. Additionally, Dr. Lee's exception can be explained by the fact that he was an exceptional leader. Within the five practices of exemplary leadership in crisis, he ranked third overall in the demonstration of model the way, third in encourage the heart, fourth in inspire a shared vision, tied for fourth in challenge the process, and fifth in enabled others to act. He demonstrated the practices of exemplary leadership regularly and was rated in the top five of the WHO DGs in each variable.

Another anomaly that challenged the hypothesis was Dr. Nakajima. Like Dr. Lee, he did not hold any previous public office or have any political experience but had two top five assessments (non-crisis relative values and non-crisis raw data assessments). Dr. Nakajima had sixteen years of WHO experience, second most among the DGs, had six total years of medical education, first among the DGs, and had seventeen years of medical experience, the second most of any DG. Additionally, in his demonstration of the practices of exemplary leadership in non-crisis situations, Dr. Nakajima ranked third in inspire a shared vision, second in enabled others to act, and third in challenge the process. These rankings allowed Dr. Nakajima to be in the top five subgroup in non-crisis overall leadership success assessments and be an exception to this study's hypothesis.

Conclusions

While this study ranked the WHO DGs and placed them in the top five or bottom four of the group, all nine of the DGs were exceptional leaders and had to be in order to become the world's "Top Doc." This study's purpose is to provide a possible explanation as to why some of the DGs appeared to have performed better than the others.

What can the results of this study and these assessments mean for the WHO and the selection of the organization's DG, the selection of a leader of any healthcare organization, or how can the assessments and results of this study better prepare potential leaders or managers who are

seeking executive level positions and ensure that he or she has the necessary background to properly and effectively lead an organization in its day-to-day operations or in times of crisis?

Effective leaders should display and exhibit Kouzes and Posner's Five Exemplary Practices of Leadership (model the way, inspire a shared vision, enable others to act, challenge the process, and encourage the heart).[13] These time proven and tested leadership practices should represent an organization's required or desired prerequisites of a candidate who is vying for an important position such as the WHO DG. These practices should also be part of a leader's resume when applying for and taking over the reins of an organization.

Effective leaders should display and exhibit Kouzes and Posner's Five Exemplary Practices...

The literature review did not uncover any existing prerequisites for those hired as a DG. Should the WHO decide to publish a list of required or desired traits that a DG should have, the WHO Executive Board can turn to this, or similar studies, to determine which practices of exemplary leadership they would like a potential DG to have based on the previous nine DGs and how they led in a day-to-day basis and how they responded to crises.

In addition to developing prerequisites and desired leadership characteristics and traits that a potential candidate should have, the WHO or any other organization can, as was done in this study, analyze speeches and written documents of potential candidates and look for their demonstration, or lack thereof, of the practices of exemplary leadership. Many organizations currently practice something similar to this. Many organizations filter resumes through automated artificial intelligence programs that look for the presence of certain "buzz" words that will help them narrow down the number of candidates for a position. A deeper analysis into potential candidates for a position would be needed when looking for evidence of the practices of exemplary leadership.

Besides emphasizing the exemplary practices of leadership, the WHO Executive Board can also narrow the field of candidates for the WHO DG position, by requiring potential DGs to have had some political experience, have held previous public medical office outside of routine medical positions, or other diverse experiences because WHO DGs with these types of diverse experiences have performed better than those without them over the past 76 years. For other healthcare organizations, when vetting candidates for positions, they can reference this study as justification for seeking candidates with more varied backgrounds.

From the perspective of a potential candidate for an executive level healthcare position, the results of this study can also assist them in preparing for these types of billets as well. A potential candidate for a position, such as the WHO DG or an executive in a healthcare organization, can do a self-assessment using the practices of exemplary leadership to determine if he or she lacks one or more of the practices in their backgrounds. Many applicants are asked during interviews what their weaknesses are. An assessment of this type could help prepare a candidate for an interview or the position itself. Knowing what one's weaknesses are, a leader can work to improve those weaknesses or surround him or herself with personnel who would compensate for their shortcomings and weaknesses. Additionally, since diverse experiences appear to improve leadership, candidates can seek out positions that will challenge them and help them grow as leaders.

When Dr. Tedros Ghebreyesus became the front runner for the position of the WHO DG in the 2017 election, many of the articles published immediately began to attack his nomination

because he was not a medical doctor. Just two years after his election, he was leading the WHO during, and through, one of the most deadly and fast moving viruses the world had ever seen; COVID-19. Many questioned whether or not he had the right acumen or whether he was the right choice to lead such a diverse organization through a global pandemic. Today, there are many critics of how Dr. Ghebreyesus and the WHO handled the devastating corona virus. While history has yet to judge him or the WHO, based on the assessments of his leadership abilities found in this study, there are not many people who were as qualified as Dr. Ghebreyesus to lead the WHO and the international community through the two plus year health crisis.

The election of Dr. Ghebreyesus as the WHO DG shows the willingness of the international healthcare community to think outside the box and select a candidate that did not fit the standard mold of previous WHO DGs. While the WHO Executive Board probably did not do an in-depth study of Dr. Ghebreyesus' demonstration of the practices of exemplary leadership, perhaps it is time to start considering an analysis of leadership abilities and potential versus just the positions a person has held in order to determine if he or she is a good fit for a position like a WHO DG. This is the primary recommendation of this study.

Additionally, while this study focused exclusively on the eight previous WHO DGs as well as the current WHO DG, the methodologies and recommendations of this study can be applied outside the healthcare arena to include other international, national, joint, combined, and interagency organizations. Leadership is universal and crosses all boundaries to include military, political, and academia just to mention a few. Similar studies, based on some of the assessments of this work, are also recommended. ***IAJ***

Notes

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