Analysis of world terror networks from the reduced Google matrix of Wikipedia

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Abstract. We apply the reduced Google matrix method to analyse interactions between 95 terrorist groups and determine their relationships and influence on 64 world countries. This is done on the basis of the Google matrix of the English Wikipedia (2017) composed of 5 416 537 articles which accumulate a great part of global human knowledge. The reduced Google matrix takes into account the direct and hidden links between a selection of 159 nodes (articles) appearing due to all paths of a random surfer moving over the whole network. As a result we obtain the network structure of terrorist groups and their relations with selected countries. Using the sensitivity of PageRank to a weight variation of specific links we determine the geopolitical sensitivity and influence of specific terrorist groups on world countries. We argue that this approach can find useful application for more extensive and detailed data bases analysis.

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1 Introduction

"A new type of terrorism threatens the world, driven by networks of fanatics determined to inflict maximum civilian and economic damages on distant targets in pursuit of their extremist goals" [25]. The origins of this world wide phenomenon are under investigation in political, social and religious sciences (see e.g. [16,17,25,26] and Refs. therein). At the same time the number of terrorist groups is growing in the world [28] reaching over 100 officially recognized groups acting in various countries of the world [36]. These numbers become quite large and the mathematical analysis of multiple interactions between these groups and their relationships to world countries is getting of great timeliness. The first steps in this direction are reported in a few publications (see e.g. [11,20]) showing that the network science methods (see e.g. [3]) should be well adapted to such type of investigations. However, it is difficult to obtain a clear network structure with all dependencies which are emerging from the surrounding world with all its complexity.

In this work we use the approach of the Google matrix \(G\) and PageRank algorithm developed by Brin and Page for large scale WWW network analysis [2]. The mathematical and statistical properties of this approach for various networks are described in [5,19]. The efficiency of these methods are demonstrated for Wikipedia and world trade networks in [16,18]. For the analysis of the terror networks we use the reduced Google matrix approach developed recently [7,8,9]. This approach selects from a global large scale network a subset of nodes of interest and constructs the reduced Google matrix \(G_R\) for this subset including all indirect links connecting the subset nodes via the global network. The analysis of political leaders and world countries subsets of Wikipedia networks in various language editions demonstrated the efficiency of this analysis [8,9]. Here, for the English Wikipedia network (collected in May 2017), we target a subset of \(N_g = 95\) terrorist groups referenced in Wikipedia articles of groups enlisted as terrorist groups for at least two countries in [36] (see Table 1). The collection of 24 editions of Wikipedia networks dated by May 2017 is available at [10]. In addition we select the group of \(N_c = 64\) related world countries given in Table 2. This gives us the size of \(G_R\) being \(N_r = N_g + N_c = 159\) that is much smaller then the global Wikipedia network of \(N = 5\ 416\ 537\) nodes (articles) and \(N_\ell = 122\ 232\ 932\) links generated by quotation links from one article to another. The method of the reduced Google matrix and the obtained results for interactions between terrorist groups and countries are described in the next Sections.

We note that the analysis of Wikipedia data and related networks is now in development by various groups (see e.g. [13,30,29]). Here we used the matrix methods for analysis of Wikipedia networks. These methods have their roots at the investigations of random matrix theory and quantum chaos [15].
2 Reduced Google matrix

It is convenient to describe the network of N Wikipedia articles by the Google matrix $G$ constructed from the adjacency matrix $A_j$ with elements 1 if article (node) $j$ points to article (node) $i$ and zero otherwise. In this case, elements of the Google matrix take the standard form $G_{ij} = \alpha S_{ij} + (1 - \alpha)/N$, where $S$ is the matrix of Markov transitions with elements $S_{ij} = A_{ij}/k_{out}(j)$, $k_{out}(j) = \sum_{i=1}^{N} A_{ij} \neq 0$ being the node $j$ out-degree (number of outgoing links) and with $S_{ij} = 1/N$ if $j$ has no outgoing links (dangling node). Here $0 < \alpha < 1$ is the damping factor which for a random surfer determines the probability $(1 - \alpha)$ to jump to any node; below we use the standard value $\alpha = 0.85$. The right eigenvector of $G$ with the unit eigenvalue gives the PageRank probabilities $P(j)$ to find a random surfer on a node $j$. We order all nodes by decreasing probability $P$ getting them ordered by the PageRank index $K = 1, 2, ..., N$ with a maximal probability at $K = 1$. From this global ranking we obtain the local ranking of groups and countries in Table 1.

The reduced Google matrix $G_R$ is constructed for a selected subset of nodes (articles) following the method described in [78] and based on concepts of scattering theory used in different fields of mesoscopic and nuclear physics or quantum chaos [15]. This matrix has $N_r$ nodes and belongs to the class of Google matrices. In addition the PageRank probabilities of selected $N_r$ nodes are the same as for the global network with $N$ nodes, up to a constant multiplicative factor taking into account that the sum of PageRank probabilities over $N_r$ nodes is unity. The matrix $G_R$ is represented as a sum of three matrices (components) $G_R = G_{rr} + G_{pr} + G_{qr}$ [8]. The first term $G_{rr}$ is given by the direct links between selected $N_r$ nodes in the global $G$ matrix with $N$ nodes, the second term $G_{pr}$ is rather close to the matrix in which each column is given by the PageRank vector $P_r$, ensuring that PageRank probabilities of $G_R$ are the same as for $G$ (up to a constant multiplier). Therefore $G_{pr}$ doesn’t provide much information about direct and indirect links between selected nodes. The most interesting is the third matrix $G_{qr}$ which takes into account all indirect links between selected nodes appearing due to multiple links via the global network nodes $N$ [78]. The matrix $G_{qr} = G_{qrd} + G_{qrd}$ has diagonal ($G_{qrd}$) and nondiagonal ($G_{qrd}$) parts. The part $G_{qrd}$ represents the main interest since it describes indirect interactions between nodes. The explicit formulas as well as the mathematical and numerical computation methods of all three components of $G_R$ are given in [78,9].

The selected groups and countries are given in Tables 1 and 2 in order of their PageRank probabilities (given by KG rank column for groups and Rank column for countries, respectively). All countries have PageRank probabilities being larger than those of terrorist groups so that they are well separated.

3 Results

In this work we extract from $G_R$ a network of 64 countries and 95 groups. This network reflects direct and indirect interactions between countries and groups, which motivates us to study the relative influence of group alliances on the other ones and on the countries. The matrix $G_R$ and its three components $G_{rr}, G_{pr}$ and $G_{qr}$ are computed for $N_r = 159$ Wikipedia network nodes formed by $N_c = 64$ country nodes and $N_g = 95$ group nodes. The weights of these three $G_R$ components are $W_{rr} = 0.0644, W_{pr} = 0.8769$ and $W_{qr} = 0.0587$ (the weight is given by the sum of all matrix elements divided by $N_r$, thus $W_{rr} + W_{pr} + W_{qr} = 1$). The dominant component is $G_{pr}$ but as stated above it is approximately given by columns of the PageRank vector so that the most interesting information is provided by $G_{rr}$ and especially the component $G_{qr}$ given by indirect links [9].

The matrix elements of $G_{rr}, G_{pr}, G_{qr}$ corresponding to the part of 95 terrorist groups are shown in the color maps of Fig. 1 (indices are ordered by increasing values of KG as given in Table 1) thus element with KG1—KG1 is located at the top left corner). The largest matrix elements of $G_R$ are the ones of top PageRank groups of Table 1. Such large values are enforced by $G_{pr}$ component which is dominated by PageRank vector. The elements of $G_{rr}$ and $G_{qr}$ are smaller but they determine direct and indirect interactions between groups.

According to Fig. 1 the strong interactions between groups can be found by analyzing $G_{qr}$ looking at new links appearing in $G_{qr}$ and being absent from $G_{rr}$. As an example we list:

- Tehrik-i-Taliban Pakistan (KG22) and Jundallah (KG94);
- Hamas (KG5) and Izz ad-Din al-Qassam Brigades (KG45);
- Taliban (KG3) and Al-Qaeda in the Arabian Peninsula (KG21);
- Kurdistan Freedom Hawks (KG72) and Kurdistan Workers’ Party (KG9).

3.1 Network structure of groups

To analyze the network structure of groups we attribute them to 6 different categories marked by 6 colors in Table 1:

- C1 for the International category of groups operating worldwide (color BL, top group is KG1 ISIS);
- C2 for the groups targeting Asian countries (color RD, top group is KG3 Taliban);
- C3 for the groups related with the Israel-Arab conflict (color OR, top group is KG5 Hamas);
- C4 for the groups targeting African countries (color GN, top group is KG10 Al-Shabaab);
- C5 for the groups related to Arab countries at Middle East and the Arabian Gulf (color PK, top group is KG13 Houthis);
- C6 for all remaining groups (color BK, top group is KG4 IRA).
These 6 categories of groups is related to their activity and their geographical location. Only the category C1 has global international activity, other categories have more local geographical activity. We will see that the network analysis captures these categories.

We analyze the network structure of groups by selecting the top group node of each category in Table 1 and then, their top 4 friends in $G_{rr} + G_{qrnd}$ (i.e. the nodes with the 4 largest matrix elements of $G_{rr} + G_{qrnd}$ in the column representing the group of interest. It corresponds to the 4 largest outgoing link weights). From the set of top group nodes and their top 4 friends, we continue to extract the top 4 friends of friends until no new node is added to this network of friends. The obtained network structure of groups is shown in Fig.2. This network structure clearly highlights the clustering of nodes corresponding to selected categories. It shows the leading role of top PageRank nodes for each category appearing as highly central nodes with large in-degree. We note that we speak about networks of friends and followers using the terminology of social networks. Of course, this has only associative meaning (we do not mean that some country is a friend of terrorist group).

The appearance of links due to indirect relationships between groups is confirmed by well-known facts. For instance, it can be seen that Al-Qaeda in the Arabian Peninsula (KG21) is linking Al-Shabaab (KG10) and Houthis (KG13). Al-Qaeda in the Arabian Peninsula is primarily active in Saudi Arabia. It is well known that Saudi Arabia is an important financial support of Al-Shabaab [14] and that Houthis is confronting Saudi Arabia. As such, it makes sense that Al-Qaeda in the Arabian Peninsula links both groups as it is tied to Saudi Arabia.

Another meaningful example is the one of Hezbollah (KG6) and Houthis that share the same ideology, since they are both Shiite and are strongly linked to Iran. From Fig. 2, it can be seen that Hezbollah is a direct friend of Houthis. The case of Hamas (KG5) and Hezbollah, that share the same ideology, since they are both Shiite and are strongly linked to Iran. From Fig. 2, it can be seen that Hezbollah is a direct friend of Hamas. Finally, the network of Fig. 2 shows as well that Hezbollah is the linking group between Hamas and Houthis. As shown in Fig. 3 and knowing the relationship between Hezbollah and Houthis, we can explain why Israel is a linking node between Houthis and Hamas. Finally, we find that Iran links Houthis with ISIS. This could be explained by the fact that both groups are in conflict with Saudi Arabia.

3.3 Sensitivity analysis

To analyze more specifically the influence of given terrorist groups on the selected 64 world countries we introduce the sensitivity $F$ determined by the logarithmic derivatives of PageRank probability $P$ obtained from $G_R$. At first we define $\delta_{ij}$ as the relative fraction to be added to the relationship from node $j$ to node $i$ in $G_R$. Knowing $\delta_{ij}$, a new modified matrix $G_R$ is calculated in two steps. First, element $G^*_R(i, j)$ is set to $(1 + \delta_{ij}) \cdot G^R(i, j)$. Second, all elements of column $j$ of $G^*_R$ are normalized to 1 (including element $i$) to preserve the column-normalized property of this matrix from the class of Google matrices. After that $G_R$ reflects an increased probability for going from node $j$ to node $i$.

It is now possible to calculate the modified PageRank eigenvector $\tilde{P}$ from $G^*_R$ using the standard $G^*_R \tilde{P} = \tilde{P}$ relation and compare it to the original PageRank probabilities $P$ calculated with $G_R$ using $G_R P = P$. Due to the relative change of the transition probability between nodes $i$ and $j$, the steady state PageRank probabilities are modified. This reflects a structural modification of the network and entails a change of importance of nodes in the network. These changes are measured by a logarithmic derivative of the PageRank probabilities:

$$D_{j \rightarrow i}(k) = \frac{dP_k}{d\delta_{ij}}/P_k = (\tilde{P}_k - P_k)/\delta_{ij}P_k \quad (1)$$

so that the derivative $D_{j \rightarrow i}(k)$ gives for node $k$ its sensitivity to the change of link $j$ to $i$. We note that this approach is similar to the sensitivity analysis of the world trade network to the price of specific products (e.g. gas or petroleum) as studied in [6].
Fig. 4 shows maps of the sensitivity influence $D$ of the top groups of the 6 categories on all 64 countries. Here we see that Taliban (KG3) has important influence on Afghanistan, Pakistan, and Saudi Arabia and less influence on other countries. In contrast ISIS (KG1) has a strong worldwide influence with the main effects on Canada, Libya, USA, Saudi Arabia. The world maps show that the groups of the left column (Taliban, Hamas, Houthis) produce mainly local influence in the world. In contrast, the groups of the right column (ISIS, Al Shabaab, IRA) spread their influence worldwide. Even if IRA mainly affects UK it still spreads its influence on other Anglo-Saxon countries. The presented results determine the geopolitical influence of each terrorist group.

Fig. 5 shows the influence of a relation between one selected country $c$ and one selected terrorist group $i$ on the other countries $j$. The results are shown for two countries being US (left panel - $c = 1$) and Saudi Arabia (right panel - $c = 46$). Each element $(i,j)$ of the given matrices is expressed by $D_{(c→i)}(j))$. Results show the enormous influence of Saudi Arabia on terrorist groups and other countries (almost all panel is in red). The influence of USA is more selective.

All data for the matrices discussed above, figures and sensitivity are available at [36].

4 Discussion

We have applied the reduced Google matrix analysis (Fig.4) to the network of articles of English Wikipedia to analyze the network structure of 95 terrorist groups and their influence over 64 world countries (159 selected articles). This approach takes into account all human knowledge accumulated in Wikipedia, leveraging all indirect interactions existing between the 159 selected articles and the huge information contained by 5 416 537 articles of Wikipedia and its 122 232 932 links. The network structure obtained for the terrorist groups (Figs. 2, 3) clearly show the presence of 6 types (categories) of groups. The main groups in each category are determined from their PageRank. We show that the indirect or hidden links between terrorist groups and countries play an important role and are, in many cases, predominant over direct links. The geopolitical influence of specific terrorist groups on world countries is determined via the sensitivity of PageRank variation in respect to specific links between groups and countries (Fig. 4). We see the presence of terrorist groups with localized geographical influence (e.g. Taliban) and others with worldwide influence (ISIS). The influence of selected countries on terrorist groups and other countries is also determined by the developed approach (Fig.6). The obtained results, tested on the publicly available data of Wikipedia, show the efficiency of the analysis. We argue that the reduced Google matrix approach can find further important applications for terror networks analysis using more advanced and detailed databases.

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Fig. 1. Density plots of matrices $G_R$, $G_{rr}$ and $G_{qrr}$ (top, middle and bottom; color changes from red at maximum to blue at zero); only 95 terrorist nodes of Table I are shown.
Fig. 2. Friendship network structure between terrorist groups obtained from $G_{qr} + G_{rr}$; colors mark categories of nodes and top nodes are given in text and Table 1; circle size is proportional to PageRank probability of nodes; bold black arrows point to top 4 friends, gray tiny arrows show friends of friends interactions computed until no new edges are added to the graph (drawn with [1,12]).

Fig. 3. Friendship network structure extracted from $G_{qr} + G_{rr}$ with the top terrorist groups (marked by their respective colors) and countries (marked by cyan color). Top panel: the network in case of 2 friends for top terrorist groups of each category and top friend 2 countries for each group. Bottom panel: friendship network structure with the top terrorist groups of each category and their top 4 friend countries. Networks are drawn with [1,12].
Fig. 4. World map of the influence of terrorist groups on countries expressed by sensitivity $D_{ij} (j)$ where $j$ is the country index and $i$ the group index, see text). Left column: Taliban KG3, Hamas KG5, Houthis KG13 (top to bottom). Right column: ISIS KG1, Al Shabaab KG10, IRA KG4 (top to bottom). Color bar marks $D_{ij} (j)$ values with red for maximum and green for minimum influence; grey color marks countries not considered is this work.

Fig. 5. Sensitivity influence $D_{(c\rightarrow i)} (j)$ for the relation between a selected country $c$ and a terrorist group $i$ (represented by group index $i$ from Table in vertical axis) on a world country $j$ (represented by country index $j$ from Table in horizontal axis, $j = c$ is excluded) for two $c$ values: USA (top), Saudi Arabia (bottom). Color shows $D_{(c\rightarrow i)} (j)$ value is changing in the range $(-2.8 \cdot 10^{-4}, 2.1 \cdot 10^{-4})$ for USA and $(-4.8 \cdot 10^{-3}, 10^{-3})$ for SA; minimum/maximum values correspond to blue/red.
Table 1. List of selected terrorist groups (from [36]) attributed to 6 categories marked by color, KG gives the local PageRank index of terrorist groups.

| Name                                                   | KG | Color | Name                                                      | KG | Color |
|--------------------------------------------------------|----|-------|-----------------------------------------------------------|----|-------|
| Islamic State of Iraq and the Levant                   | 1  | BL    | Hezb-e Islami Gulbuddin                                  | 49 | RD    |
| Al-Qaeda                                               | 2  | BL    | Kach and Kahan-e Chai                                    | 50 | BK    |
| Taliban                                                | 3  | RD    | Palestine Liberation Front                                | 51 | OR    |
| Provisional Irish Republican Army                      | 4  | BK    | Harkat-ul-Mujahideen                                     | 52 | RD    |
| Hamas                                                  | 5  | OR    | Kurdistan Free Life Party                                 | 53 | BK    |
| Hezbollah                                              | 6  | OR    | Indian Mujahideen                                        | 54 | RD    |
| Muslim Brotherhood                                     | 7  | BL    | Abu Nidal Organization                                   | 55 | OR    |
| Liberation Tigers of Tamil Eelam                       | 8  | RD    | Hizbul Mujahideen                                        | 56 | RD    |
| Kurdistan Workers’ Party                              | 9  | BK    | Libyan Islamic Fighting Group                              | 57 | GN    |
| Al-Shabaab (militant group)                            | 10 | GN    | Islamic State of Iraq and the Levant in Libya            | 58 | GN    |
| ETA (separatist group)                                 | 11 | BK    | Revolutionary People’s Liberation Party/Front            | 59 | BK    |
| FARC                                                   | 12 | BK    | Al-Mourabitoun                                            | 60 | GN    |
| Houthis                                                | 13 | PK    | Revolutionary Organization 17 November                   | 61 | BK    |
| Al-Nusra Front                                         | 14 | PK    | Holy Land Foundation for Relief and Development          | 62 | OR    |
| Boko Haram                                             | 15 | GN    | Ansar al-Sharia (Libya)                                   | 63 | GN    |
| Ulster Volunteer Force                                 | 16 | BK    | Al-Ithihaad al-Islamiya                                  | 64 | GN    |
| Shining Path                                           | 17 | BK    | Al-Haramain Foundation                                   | 65 | BL    |
| Popular Front for the Liberation of Palestine          | 18 | OR    | Ansar Bait al-Maqdis                                     | 66 | PK    |
| Lashkar-e-Taiba                                        | 19 | RD    | Ansaru                                                    | 67 | GN    |
| Hizb ut-Tahrir                                         | 20 | BL    | Babbar Khalsa                                            | 68 | BL    |
| Al-Qaeda in the Arabian Peninsula                      | 21 | PK    | Jamaat-ul-Mujahideen Bangladesh                          | 69 | RD    |
| Tehrik-i-Taliban Pakistan                             | 22 | RD    | Force 17                                                 | 70 | OR    |
| Islamic Jihad Mov. in Palestine                        | 23 | OR    | Kata’ib Hezbollah                                        | 71 | PK    |
| Ulster Defence Association                             | 24 | BK    | Kurdistan Freedom Hawks                                 | 72 | BK    |
| Abu Sayyaf                                             | 25 | RD    | Islamic Jihad Union                                      | 73 | RD    |
| Real Irish Republican Armym                            | 26 | BK    | Abdullah Azzam Brigades                                  | 74 | PK    |
| Ansar Dine                                             | 27 | GN    | Moroccan Islamic Comb. Group                             | 75 | GN    |
| Jamaah Islamiyah                                        | 28 | RD    | Ansar al-Sharia (Tunisia)                                 | 76 | GN    |
| Al-Qaeda in the Islamic Maghreb                        | 29 | GN    | Al-Qaeda, Indian Subcontinent                            | 77 | RD    |
| Egyptian Islamic Jihad                                  | 30 | PK    | Jund al-Aqsa                                             | 78 | PK    |
| Al-Jama’a al-Islamiya                                  | 31 | PK    | Hezbollah Al-Hejaz                                       | 79 | PK    |
| Jaish-e-Mohammed                                       | 32 | RD    | Jamaat-ul-Ahrar                                          | 80 | RD    |
| Aum Shishiriyo                                          | 33 | RD    | Jamaat Ansharut Tawhid                                   | 81 | RD    |
| United Self-Defense Forces of Colombia                 | 34 | BK    | Islamic State of Iraq and the Levant – Algeria Province  | 82 | GN    |
| Armed Islamic Group of Algeria                         | 35 | GN    | Osbat al-Ansar                                           | 83 | PK    |
| Continuity Irish Republican Army                       | 36 | BK    | International Sikh Youth Federation                      | 84 | RD    |
| Movement for Oneness and Jihad in West Africa          | 37 | GN    | East Turkestan Liberation Organization                    | 85 | RD    |
| Quds Force                                              | 38 | PK    | Great Eastern Islamic Raiders’ Front                      | 86 | BK    |
| Al-Aqsa Martyrs’ Brigades                              | 39 | OR    | Aiden-Abyan Islamic Army                                 | 87 | PK    |
| Com. Party of the Philippines                          | 40 | RD    | Al-Aqsa Foundation                                       | 88 | OR    |
| Caucasus Emirate                                       | 41 | RD    | Khalistan Zindabad Force                                 | 89 | RD    |
| Haqqani network                                         | 42 | RD    | Mujahidin Indonesia Timur                                | 90 | RD    |
| Turkistan Islamic Party                                | 43 | RD    | Al-Badr                                                  | 91 | RD    |
| Ansar al-Islam                                         | 44 | PK    | Soldiers of Egypt                                        | 92 | PK    |
| Izz ad-Din al-Qassam Brigades                          | 45 | OR    | National Liberation Army                                 | 93 | BK    |
| Lashkar-e-Jhangvi                                      | 46 | RD    | Jundallah                                                | 94 | RD    |
| Harkat-ul-Jihad al-Islami                             | 47 | RD    | Army of Islam                                            | 95 | PK    |
| Islamic Movement of Uzbekistan                         | 48 | RD    |                                                           |     |       |
Table 2. List of selected countries.

| Rank | Name               | abr | Rank | Name               | abr |
|------|--------------------|-----|------|--------------------|-----|
| 1    | United States      | US  | 33   | Portugal           | PT  |
| 2    | France             | FR  | 34   | Ukraine            | UA  |
| 3    | Germany            | DE  | 35   | Czech Republic     | CZ  |
| 4    | United Kingdom     | GB  | 36   | Malaysia           | MY  |
| 5    | Iran               | IR  | 37   | Thailand           | TH  |
| 6    | India              | IN  | 38   | Vietnam            | VN  |
| 7    | Canada             | CA  | 39   | Nigeria            | NG  |
| 8    | Australia          | AU  | 40   | Afghanistan        | AF  |
| 9    | China              | CN  | 41   | Iraq               | IQ  |
| 10   | Italy              | IT  | 42   | Bangladesh         | BD  |
| 11   | Japan              | JP  | 43   | Syria              | SY  |
| 12   | Russia             | RU  | 44   | Morocco            | MA  |
| 13   | Spain              | ES  | 45   | Algeria            | DZ  |
| 14   | Netherlands        | NL  | 46   | Saudi Arabia       | SA  |
| 15   | Poland             | PL  | 47   | Lebanon            | LB  |
| 16   | Sweden             | SE  | 48   | Kazakhstan         | KZ  |
| 17   | Mexico             | MX  | 49   | Albania            | AL  |
| 18   | Turkey             | TR  | 50   | United Arab Emirates| AE |
| 19   | South Africa       | ZA  | 51   | Yemen              | YE  |
| 20   | Switzerland        | CH  | 52   | Tunisia            | TN  |
| 21   | Philippines        | PH  | 53   | Jordan             | JO  |
| 22   | Austria            | AT  | 54   | Libya              | LY  |
| 23   | Belgium            | BE  | 55   | Uzbekistan         | UZ  |
| 24   | Pakistan           | PK  | 56   | Kuwait             | KW  |
| 25   | Indonesia          | ID  | 57   | Qatar              | QA  |
| 26   | Greece             | GR  | 58   | Mali               | ML  |
| 27   | Denmark            | DK  | 59   | Kyrgyzstan         | KG  |
| 28   | South Korea        | KR  | 60   | Tajikistan         | TJ  |
| 29   | Israel             | IL  | 61   | Oman               | OM  |
| 30   | Hungary            | HU  | 62   | Turkmenistan       | TM  |
| 31   | Finland            | FI  | 63   | Chad               | TD  |
| 32   | Egypt              | EG  | 64   | South Sudan        | SS  |