

Mapping Global Prevalence of the Opportunist *Acinetobacter baumannii* and Recent Vaccine Development to Tackle It

Supplementary Materials

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Table S1. Type strains for the phylogenetic analysis of Acb complex

Species	Type Strain	GenBank Accession
<i>A. baumannii</i>	ATCC 19606	HE651907
<i>A. calcoaceticus</i>	ATCC 23055	AJ888984
<i>A. nosocomialis</i>	RUH 2376	NR_117931
<i>A. pittii</i>	DSM 21653	NR_116774
<i>A. seifertii</i>	LUH 1472	NR_134684
<i>A. lactucae</i>	NRRL B-41902	NR_152004
<i>A. oleivorans</i>	DR1	NR_102814
<i>M. osloensis</i>	DSM 6998	AB643599

Table S2. Worldwide data for percentage of carbapenem-resistant *A. baumannii* (R%)

Country (Region)	Area	Sample Collected Year (2009-2019)	R%	Reference
Armenia	Middle East	2018 Full Year	0% ⁺	RA [1]
Belize	Latin America	2009-2017	0%	RA ¹ [2]
Finland	Europe	2018 Full Year	0%*	SP ² [3]
Iceland	Europe	2018 Full Year	0% ⁺	SP [3]
Norway	Europe	2018 Full Year	0%	SP [3]
Togo	Africa	2011.01-2012.12	0% ⁺	RA [4]
Ireland	Europe	2018 Full Year	1.8%	SP [3]
United Kingdom	Middle East	2018 Full Year	1.8%	SP [3]
Australia	Oceania	2017 Full Year	2.8%	SP [5]
Switzerland	Europe	2018 Full Year	3%	SP [1]
Japan	Asia	2018 Full Year	3.5%	SP [6]
Sweden	Europe	2018 Full Year	3.7%	SP [3]
Belgium	Europe	2018 Full Year	3.8%	SP [3]
Austria	Europe	2018 Full Year	4.4%	SP [3]
Germany	Europe	2018 Full Year	4.4%	SP [3]
Netherlands	Europe	2018 Full Year	4.6%	SP [3]
Canada	North America	2018 Full Year	4.7%	SP [7]
Denmark	Europe	2018 Full Year	6.4%	SP [3]
France	Europe	2018 Full Year	6.5%	SP [3]
New Zealand	Oceania	2016 Full Year	6.5%	SP [8]
Guyana	Latin America	2008.01-2014.12	7.5%	RA [9]
Sierra Leone	Africa	2018.02-2018.06	8.7%*	RA [10]
Cambodia	Asia	2007-2016	11.1%*	RA [11]
Namibia	Africa	2009.01-2012.05	12.5% ⁺	RA [12]
Zimbabwe	Europe	2012.01-2017.12	15.4%	RA [13]
Benin	Africa	Specific Period Unknown	16% ⁺	RA [14]
Equatorial Guinea	Africa	2013.07-2016.01	17.6%*	RA [15]
Slovenia	Europe	2018 Full Year	17.9%*	SP [3]
Czech Republic	Europe	2018 Full Year	19.8%	SP [3]
Dominican Republic	Latin America	2013 Full Year	20%	SP [16]
Cameroon	Africa	2005-2014	21.1%	RA [17]
Honduras	Latin America	2013 Full Year	23%	SP [16]
Grenada	Latin America	2015-2017	25%	RA [18]
Jamaica	Latin America	2009.05-2010.04	25.6%	RA [19]
Estonia	Europe	2018 Full Year	28.6%*	SP [3]
United Arab Emirates	Middle East	2017 Full Year	29.4%	SP [20]
Portugal	Europe	2018 Full Year	30.7%	SP [3]
Ethiopia	Africa	2018.04-2018.07	33.3% ⁺	RA [21]
El Salvador	Latin America	2013	38%	SP [16]
Uganda	Africa	2007.02-2009.09	38%	RA [22]
Singapore	Asia	2017 Full Year	43.2%	SP [23]
Bangladesh	Asia	2017.01-2018.01	43.5%	RA [24]
Madagascar	Africa	2006.09-2009.03	44%	RA [25]

Slovakia	Europe	2018 Full Year	44.0%	SP [3]
Qatar	Middle East	2012.01-2013.12	45.6%	RA [26]
Algeria	Africa	2011.03-2011.07	47.9%	RA [27]
United States	North America	2009-2012	47.9%	RA [28]
Chile	Latin America	2010 Full Year	48%	SP [29]
Spain	Europe	2018 Full Year	54.3%	SP [3]
Hungary	Europe	2018 Full Year	55.2%	SP [3]
Philippines	Asia	2018 Full Year	56%	SP [30]
Bolivia	Latin America	2013 Full Year	57%	SP [16]
Guatemala	Latin America	2013 Full Year	57%	SP [16]
Malaysia	Asia	2017 Full Year	61.2%	SP [31]
Uruguay	Latin America	2010 Full Year	64%	SP [29]
Pakistan	Middle East	2013-2015	65%	SP [32]
Poland	Europe	2018 Full Year	67.3%	SP [3]
Thailand	Asia	2018 Full Year	68.2%	SP [33]
Egypt	Africa	Fall and Winter 2010 Spring 2015	70.3%	RA [34]
Syria	Middle East	2008.01-2011.06	70.5%	RA [35]
Taiwan	Asia	2018 Full Year	71.3%	SP [36]
Kenya	Africa	2013-2015	72.8%	RA [37]
Venezuela	Latin America	2013 Full Year	71%	SP [16]
Mauritius	Africa	2014.07	74%	RA [38]
Saudi Arabia	Middle East	2017 Full Year	74%	SP [39]
Bulgaria	Europe	2018 Full Year	74.5%	SP [3]
Ukraine	Europe	2018 Full Year	75%*	SP [1]
China	Asia	2019 Full Year	75.1%	SP [40]
Morocco	Africa	2012.04-2014.04	76%	RA [41]
Lebanon	Middle East	2013.10-2015.12	76.5%	RA [42]
Paraguay	Latin America	2013 Full Year	77%	SP [16]
Brazil	Latin America	2017 Full Year	77.7%	SP [43]
Israel	Middle East	2017 Full Year	78%	RA [44]
North Macedonia	Europe	2018 Full Year	78%*	SP [1]
Panama	Latin America	2013 Full Year	78%	SP [16]
Latvia	Europe	2018 Full Year	78.4%	SP [3]
Moldova	Europe	Specific Period Unknown	78.7%	RA [45]
Albania	Europe	2018.02-2018.05	78.9%*	RA [46]
Nicaragua	Latin America	2013 Full Year	80%	SP [16]
Russia	Europe	2018 Full Year	79%	SP [1]
Italy	Europe	2018 Full Year	79.2%	SP [3]
Mexico	North America	2018.01-2018.06	79.6%	RA [47]
Indonesia	Asia	2017 Full Year	80.0%	SP [48]
South Africa	Africa	2017 Full Year	81%	SP [49]
Iran	Middle East	2001-2013	81.5%	RA [50]
Argentina	Latin America	2018 Full Year	82.9%	SP [51]
Ecuador	Latin America	2013 Full Year	83%	SP [16]
Cuba	Latin America	2013 Full Year	84%	SP [16]

Iraq	Middle East	2014.12-2015.05	84%	RA [52]
Cyprus	Europe	2018 Full Year	84.2%	SP [3]
Vietnam	Asia	2012-2014	84.4%	RA [53]
Kazakhstan	Asia	2012-2015	84.5%	RA [54]
India	Asia	2019 Full Year	84.8%	SP [55]
Oman	Middle East	2018 Full Year	84.9%	SP [56]
Romania	Europe	2018 Full Year	85.3%	SP [3]
Nigeria	Africa	Specific Period Unknown	85.7%*	RA [57]
Montenegro	Europe	2018 Full Year	86%*	SP [1]
Nepal	Asia	2017 Full Year	86%	RA [58]
Kuwait	Middle East	2015.03-2016.06	87.0%	RA [59]
Tunisia	Africa	2013-2016	87.1%	RA [60]
Libya	Africa	2013.04-2014.04	87.8%*	RA [61]
Rwanda	Africa	2013 Full Year	88%	RA [62]
Georgia	Europe	2018 Full Year	89%	SP [1]
Kosovo	Europe	2018 Full Year	89%	SP [1]
Sudan	Africa	2011.07-2014.08	89%	RA [63]
Lithuania	Europe	2018 Full Year	89.8%	SP [3]
Yemen	Middle East	2012.10-2013.09	90%	RA [64]
Turkey	Europe	2018 Full Year	92%	SP [1]
South Korea	Asia	2017 Full Year	92.1%	SP [65]
Greece	Europe	2018 Full Year	92.4%	SP [3]
Bosnia and Herzegovina	Europe	2018 Full Year	93%	SP [1]
Belarus	Europe	2018 Full Year	94%	SP [1]
Croatia	Europe	2018 Full Year	95.5%	SP [3]
Serbia	Europe	2018 Full Year	96%	SP [1]
Colombia	Latin America	2019 Full Year	97.0%	SP [66]
Jordan	Middle East	2009.05-2010.02	97%	RA [67]
Peru	Latin America	2014.02-2016.04	97.5%	RA [68]
Palestine	Middle East	2006.01-2014.02	98%	RA [69]
Botswana	Africa	2017 Full Year	100%*	RA [70]
Ghana	Africa	2015.02-2015.08	100% ⁺	RA [71]
Myanmar	Asia	2015.12-2018.01	100%	RA [72]
Sri Lanka	Asia	2013 Full Year	100%*	SP [73]
Timor-Leste	Asia	2017.03-2017.06	100% ⁺	RA [74]
Armenia	Middle East	N/A ³		
Azerbaijan	Middle East	N/A		
Brunei Darussalam	Asia	N/A		
Laos	Asia	N/A		
Luxembourg	Europe	N/A		
Malta	Europe	N/A		
Afghanistan	Middle East	N/A		
Andorra	Europe	N/A		
Angola	Africa	N/A		
Antigua and Barbuda	Latin America	N/A		

Bahamas	Latin America	N/A
Bahrain	Middle East	N/A
Barbados	Latin America	N/A
Bhutan	Asia	N/A
Burkina Faso	Africa	N/A
Burundi	Africa	N/A
Cabo Verde	Africa	N/A
Central African Republic	Africa	N/A
Chad	Africa	N/A
Comoros	Africa	N/A
Congo (Congo- Brazzaville)	Africa	N/A
Costa Rica	Latin America	N/A
Cote d'Ivoire	Africa	N/A
Democratic Republic of the Congo	Africa	N/A
Djibouti	Africa	N/A
Dominica	Latin America	N/A
Eritrea	Africa	N/A
Eswatini (Swaziland)	Africa	N/A
Fiji	Oceania	N/A
Gabon	Africa	N/A
Gambia	Africa	N/A
Guinea	Africa	N/A
Haiti	Latin America	N/A
Kiribati	Oceania	N/A
Kyrgyzstan	Asia	N/A
Lesotho	Africa	N/A
Liberia	Africa	N/A
Liechtenstein	Europe	N/A
Malawi	Africa	N/A
Maldives	Asia	N/A
Mali	Africa	N/A
Marshall Islands	Oceania	N/A
Mauritania	Africa	N/A
Micronesia	Oceania	N/A
Monaco	Europe	N/A
Mongolia	Asia	N/A
Mozambique	Africa	N/A
Nauru	Oceania	N/A
Niger	Africa	N/A
North Korea	Asia	N/A
Palau	Oceania	N/A
Papua New Guinea	Oceania	N/A
Saint Kitts and Nevis	Latin America	N/A

Saint Lucia	Latin America	N/A
Saint Vincent and the Grenadines	Latin America	N/A
Samoa	Oceania	N/A
San Marino	Europe	N/A
Sao Tome and Principe	Africa	N/A
Senegal	Africa	N/A
Seychelles	Africa	N/A
Solomon Islands	Oceania	N/A
Somalia	Africa	N/A
South Sudan	Africa	N/A
Suriname	Latin America	N/A
Tajikistan	Asia	N/A
Tanzania	Africa	N/A
Tonga	Oceania	N/A
Trinidad and Tobago	Latin America	N/A
Turkmenistan	Asia	N/A
Tuvalu	Oceania	N/A
Uzbekistan	Asia	N/A
Vanuatu	Oceania	N/A
Vatican	Europe	N/A
Zambia	Africa	N/A

1. Data sources are national or regional AMR surveillance programs.

2. Data sources are research or review articles.

3. No surveillance or research data available for the selected time range.

* A small number of isolates was tested ($n < 30$), and the percentage resistance should be interpreted with caution.

† Less than 10 isolates reported, and the percentage resistance should be interpreted with extreme caution.

$R\% = (\text{Number of Carbapenem-resistant } A. baumannii \text{ Isolates}) / (\text{Number of } A. baumannii \text{ Isolates})$

The sample collecting methods, susceptibility testing methods and evaluating criteria may vary in different countries (regions). Antibiotics used in the susceptibility tests usually are imipenem (10 µg for disk diffusion test) and meropenem (10 µg).

Table S3. European data (2018) for R% and F%

Country (Region)	R%	F% <small>Data sources: [1, 3]</small>
Armenia	0%	2.27%
Finland	0.0%	0.28%
Iceland	0.0%	0.52%
Norway	0.0%	0.41%
Togo	0%	3.00%
Ireland	1.7%	0.96%
United Kingdom	1.8%	1.21%
Switzerland	3%	0.60%
Sweden	3.7%	0.44%
Belgium	3.8%	1.26%
Austria	4.4%	0.73%
Germany	4.4%	1.10%
Netherlands	4.6%	0.86%
Denmark	6.4%	0.48%
France	6.5%	1.69%
Slovenia	17.9%	1.17%
Czech Republic	19.8%	0.97%
Estonia	28.6%	0.79%
Portugal	30.7%	0.78%
Slovakia	44.0%	4.88%
Spain	54.3%	0.49%
Hungary	55.2%	4.86%
Poland	67.3%	3.62%
Bulgaria	74.5%	8.59%
Ukraine	75%	18.71%
North Macedonia	78%	10.23%
Latvia	78.4%	4.16%
Russia	79%	15.11%
Italy	79.2%	3.23%
Cyprus	84.2%	9.72%
Romania	85.3%	8.91%
Montenegro	86%	10.29%
Georgia	89%	15.41%
Kosovo	89%	34.50%
Lithuania	89.8%	3.27%
Turkey	92%	13.33%
Greece	92.4%	14.26%
Bosnia and Herzegovina	93%	12.91%
Belarus	94%	21.97%
Croatia	95.5%	5.69%
Serbia	96%	18.67%

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