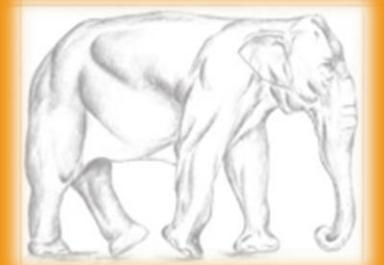


# The geography of scientific research in India from 1999 to 2015



Marion Maisonobe - CNRS - UMR Géographie-cités  
Marion.maisonobe<at>cnrs.fr  
<http://geoscimo.univ-tlse2.fr/>

# FRAME of THIS RESEARCH

- ANR Géoscience 2010-2013
- NETSCIENCE project - LABEX SMS - TOULOUSE
- NETSCITY project 2018-2021 - UMR Géographie-cités - UMR LISST - UMR IRIT
- Collaborators: Laurent Jégou, Béatrice Milard, Denis Eckert, Michel Grossetti, Guillaume Cabanac

## OUTPUTS :

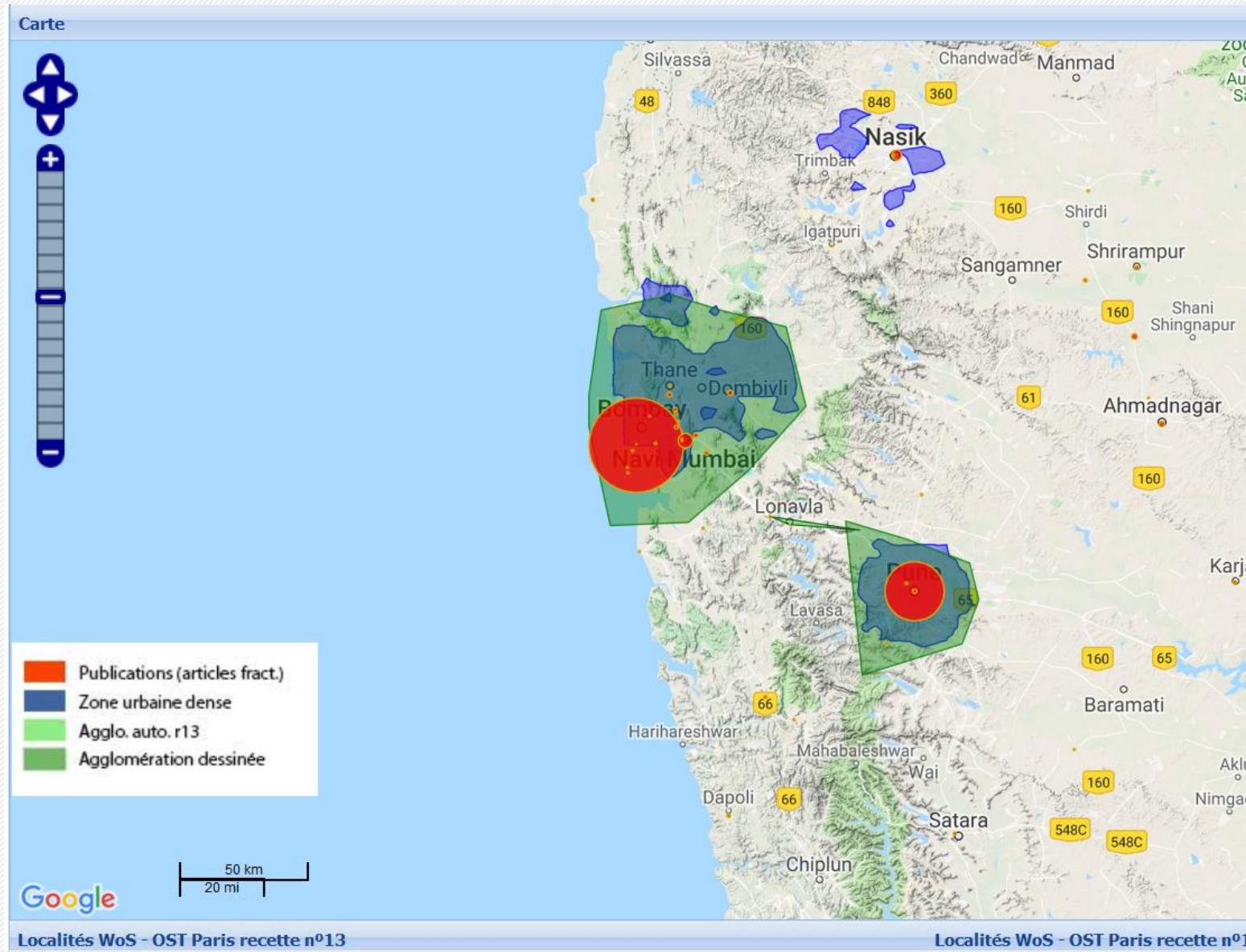
- Website: <http://geoscimo.univ-tlse2.fr/>
- Collective book: Les Ancrages Nationaux de la Science Mondiale XVIIe-XXIe siècles, IRD Editions/EDAC
- Special issue in the journal *M@ppemonde*
- Special issue in *La Revue Française de Sociologie*
- Research articles in *Urban studies*, *Informetrics* and *Scientometrics*

# Data and method

- In 2013, more than 10 000 revues and about 2 millions of publications indexed in the Web of Science (SCI Exp, SSCI, AHCI)
  1. **GEOCODING** : Almost 98% of all WoS publications (articles, reviews, letters) have been geocoded (1999-2014) = 19 millions publications
  2. **CLUSTERING** : After the geocoding, the publication data are clustered by urban areas
  3. **COUNTING** : Whole normalized counting (Gauffriau et al., 2008)

Eckert et al., 2013; Jégou, 2014; Grossetti et al., 2014; Maisonobe et al., 2016

# URBAN AREAS DELINEATION ACC. TO POPULATION DENSITY - SPATIAL DATASET AVAILABLE ONLINE



The example of:  
Mumbai & Pune

Method and dataset  
On line on CYBERGEO

Maisonobe, Jégou &  
Eckert, 2018

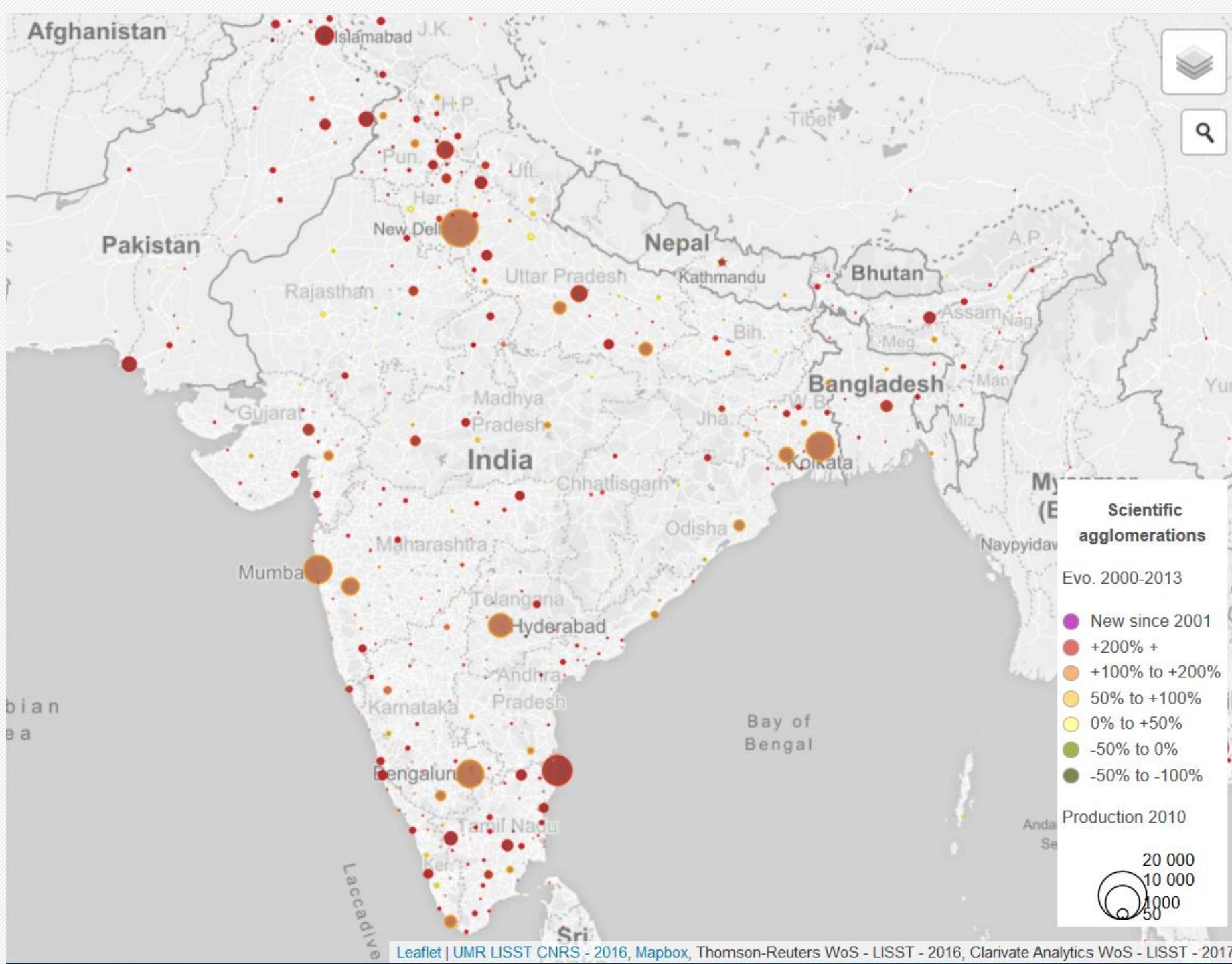
2018

871

Delineating urban agglomerations across the world: a dataset for studying the spatial distribution of academic research at city level

*Définir des agglomérations à l'échelle mondiale : un ensemble de périmètres urbains pour étudier la répartition des activités de recherches*

Marion Maisonobe, Laurent Jégou et Denis Eckert

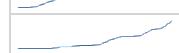


Production growth  
between 2000  
and 2013

Source:  
WoS Core Collection

Link to explore the  
Interactive map  
(author: L. Jégou) :  
<http://geoscimo.univ-tlse2.fr/interactive-map/>

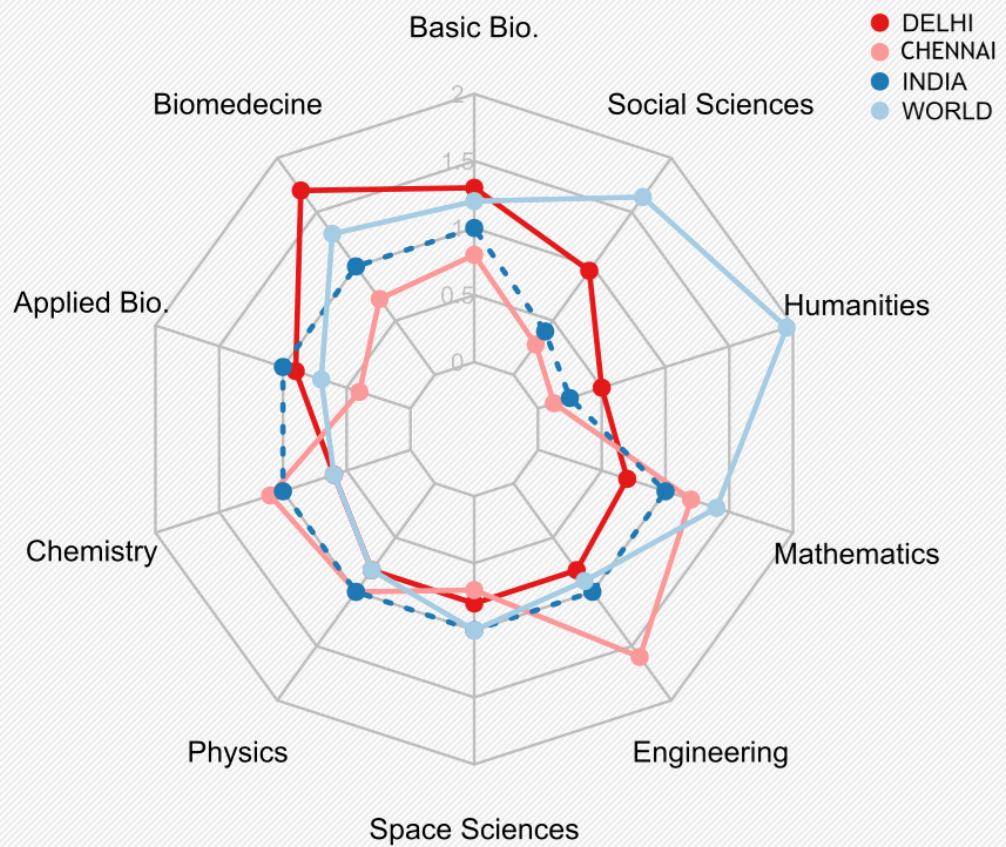
# The top 30 most publishing urban areas in India

Urban area	Country	Nb publi 2014	Trend since 1999
DELHI	INDIA	5855.5	
CHENNAI	INDIA	3911.4	
CALCUTTA	INDIA	3445.6	
BOMBAY	INDIA	3384.7	
BANGALORE	INDIA	3320.8	
HYDERABAD	INDIA	2683.7	
PUNE	INDIA	1631.9	
CHANDIGARH	INDIA	1422.2	
LUCKNOW	INDIA	1149.0	
KHARAGPUR	INDIA	1138.8	
COIMBATORE	INDIA	1034.3	
VARANASI	INDIA	877.2	
BHUBANESWAR	INDIA	794.4	
GUWAHATI	INDIA	792.6	
ROORKEE	INDIA	755.2	
KANPUR	INDIA	750.4	
VELLORE	INDIA	736.4	
AHMEDABAD	INDIA	694.2	
TIRUCHCHIRAPPALLI	INDIA	680.5	
TRIVANDRUM	INDIA	678.0	
INDORE	INDIA	590.2	
PATIALA	INDIA	475.7	
mysore	INDIA	465.7	
PONDICHERRY	INDIA	462.1	
KURUKSHETRA	INDIA	455.8	
BHOPAL	INDIA	439.3	
VADODARA	INDIA	438.2	
JAIPUR	INDIA	408.3	
COCHIN	INDIA	406.8	
ALLAHABAD	INDIA	402.6	

Source: Web of Science - SCI (articles, reviews, letters).

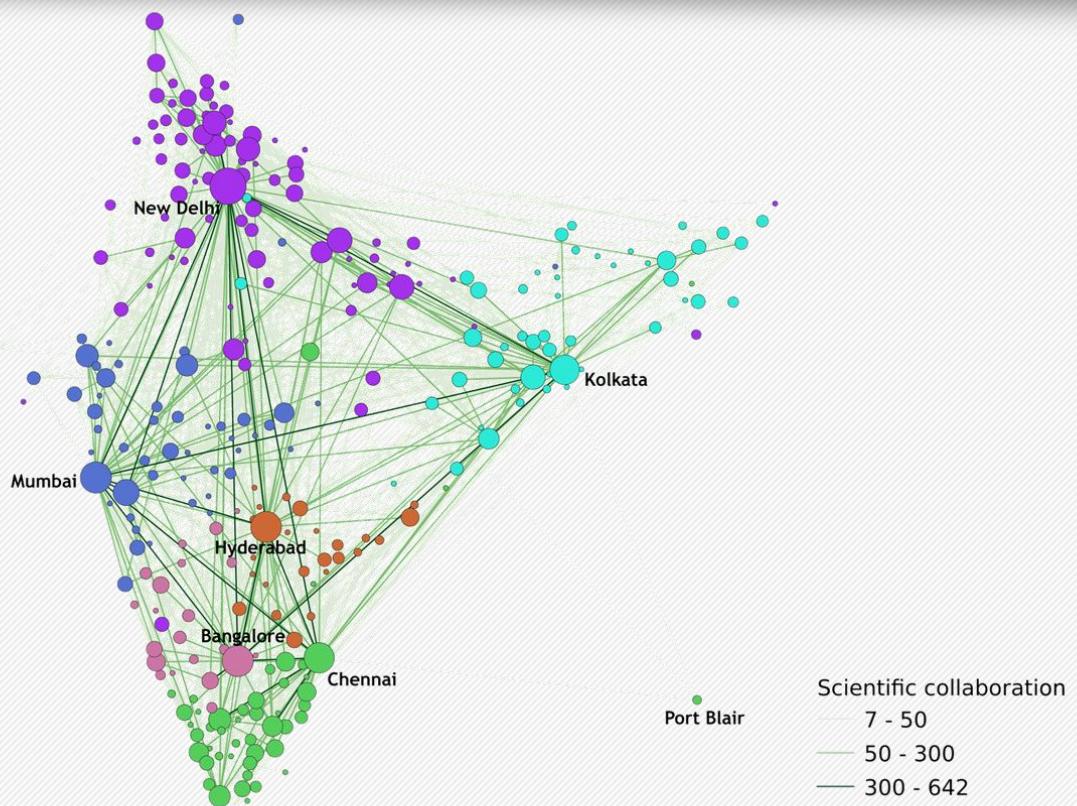
Data handling: L. Jégou - Team NETSCIENCE (LABEX SMS)

# Specialisation ratio of Delhi and Chennai compared to India



Source: 2008-2014 WoS CC production data (articles, reviews, letters).  
NETSCITY processing on Clarivate-OST-HCERES database

# Scientific collaboration in India (2007-2015)



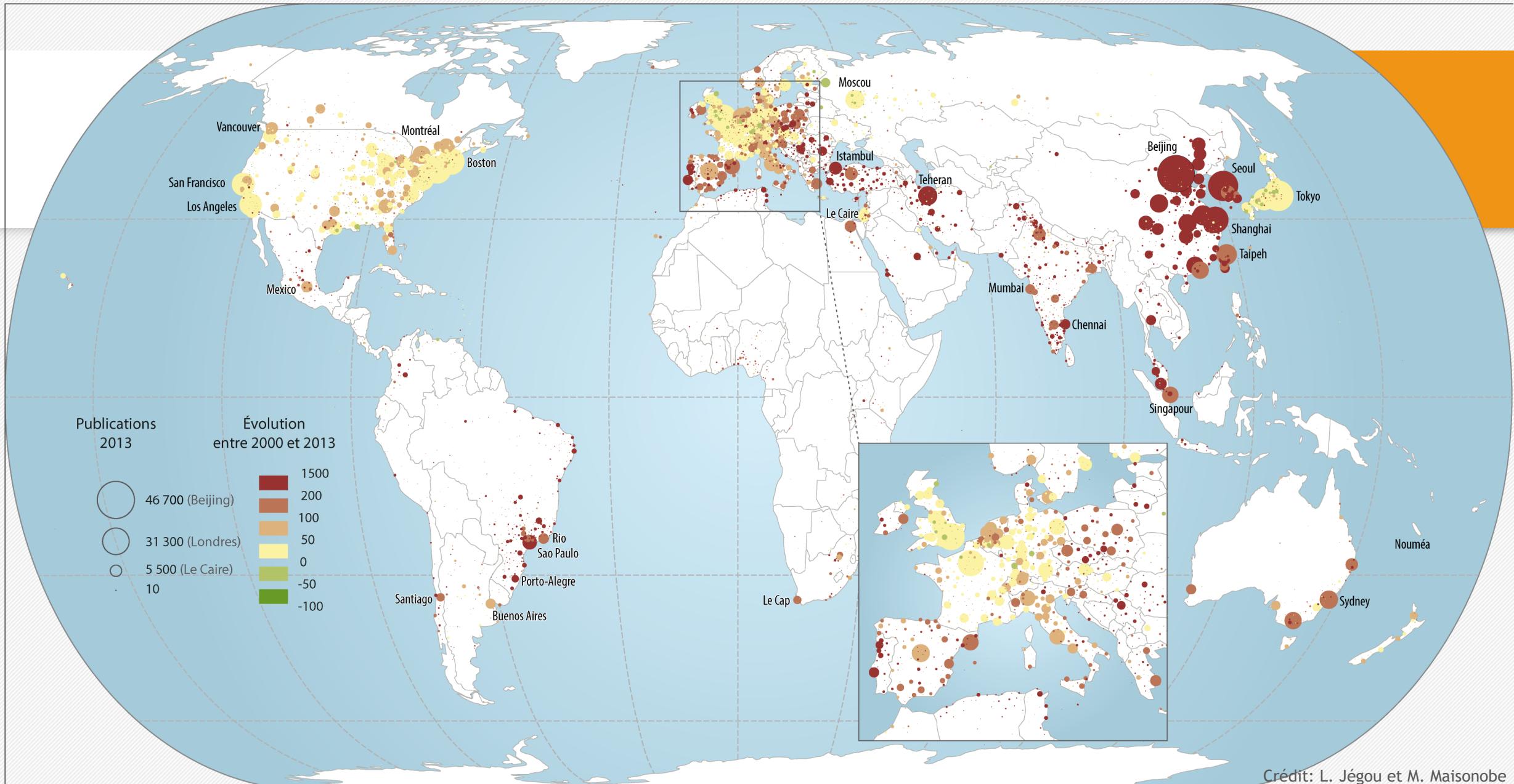
Normalised number of scientific collaboration indexed in the Science Citation Index Expanded between 2007 and 2015 within India.

Coloured groups correspond to Louvain communities (resolution = 1)

Methodology: geoscimo.univ-tlse2.fr

Research Programmes: ANR GEOSCIENCE, LABEX SMS-NETSCIENCE, NETSCITY

Author: M. Maisonneuve (CNRS - UMR Géographie-cités)



Evolution of the scientific production bet. 2000 and 2013. Source : Web of Science (articles, reviews, letters)

# World context

- an increase in the number of higher education personnel
- **a re-balancing of the global scientific output over the last thirty years**
  - at the country level to the detriment of the traditional hegemony of the US (Adams & Pendlebury, 2010 ; Royal Society, 2011)
  - and at the city level to the detriment of the traditional biggest spots (Inhaber, 1977; Grossetti et al., 2014)

# TOTAL SHARE OF GLOBAL CITATIONS

## WOS DATA

Top cited countries in 2013	Share of the global total of citations (%)**					Trend	Number of citations in 2013
	2000*	2003*	2007*	2010*	2013*		
United-States	41.7	39.4	35.5	32.1	28.4		1476235
China	1.7	3.3	5.8	8.6	13.2		686246
United-Kingdom	8.3	7.7	7.2	6.7	6.1		314376
Germany	7.5	7.1	6.8	6.4	6.0		311325
Japan	7.5	6.8	5.7	4.8	4.1		210158
France	4.7	4.3	4.2	4.0	3.6		186980
Italy	3.0	3.2	3.4	3.2	3.3		169962
Canada	3.6	3.6	3.7	3.5	3.2		165844
Australia	2.1	2.1	2.4	2.6	2.8		144700
Spain	1.9	2.2	2.6	2.7	2.7		138675
South-Korea	1.0	1.5	1.8	2.2	2.5		128640
India	0.8	1.1	1.6	2.0	2.4		123321
Netherlands	2.2	2.3	2.3	2.3	2.1		106433
Switzerland	1.8	1.7	1.6	1.6	1.5		77479
Taiwan	0.7	0.9	1.2	1.4	1.3		63732
Brazil	0.6	0.8	1.1	1.2	1.2		61518
Sweden	1.7	1.5	1.4	1.3	1.2		60431
Iran	0.1	0.2	0.5	0.8	1.1		53301
Belgium	1.0	1.0	1.0	1.0	1.0		49638
Denmark	0.9	0.9	0.9	0.9	0.9		43887

Source: Web of Science (articles, reviews and letters)

\*Mobile average over three years

\*\*Counted as a fraction of citations received over a 3-year period

# TOP 1% HIGHLY CITED PUBLICATIONS

Pays	2000	2003	2007	2010	2013	Trend	Number of publications in the 1% top cited 2013
UNITED-STATES	50.0	48.1	45.2	42.1	38.8		5142
CHINA	1.6	3.3	5.0	7.2	10.5		1394
UNITED-KINGDOM	8.7	8.3	8.1	8.0	8.2		1094
GERMANY	6.1	5.6	5.6	5.6	5.5		726
CANADA	3.4	3.5	3.8	3.8	3.4		447
AUSTRALIA	2.0	2.0	2.5	2.9	3.3		438
FRANCE	4.1	3.6	3.5	3.3	3.0		395
ITALY	2.4	2.4	2.5	2.5	2.5		337
NETHERLANDS	2.2	2.4	2.5	2.6	2.5		326
JAPAN	4.9	4.1	3.3	2.6	2.1		278
SPAIN	1.4	1.6	1.7	2.0	2.0		265
SWITZERLAND	1.9	1.8	1.8	1.8	1.7		222
SOUTH-KOREA	0.7	1.1	1.1	1.3	1.5		204
SWEDEN	1.4	1.4	1.2	1.1	1.2		160
INDIA	0.6	0.9	1.0	1.1	1.1		151
BELGIUM	0.8	0.9	0.9	1.1	1.0		136
SINGAPORE	0.3	0.5	0.6	0.8	1.0		135
DENMARK	0.9	0.9	0.9	0.9	1.0		131
IRAN	0.0	0.1	0.4	0.5	0.7		96

TOP 1% highly cited publications per Web of Science categories (articles, reviews and letters)  
 Data processed by L. Jégou, G. Cabanac and M. Maisonobe. WoS version maintained by OST-HCERES

# Deconcentration and diversification of the places of production of scientific publications

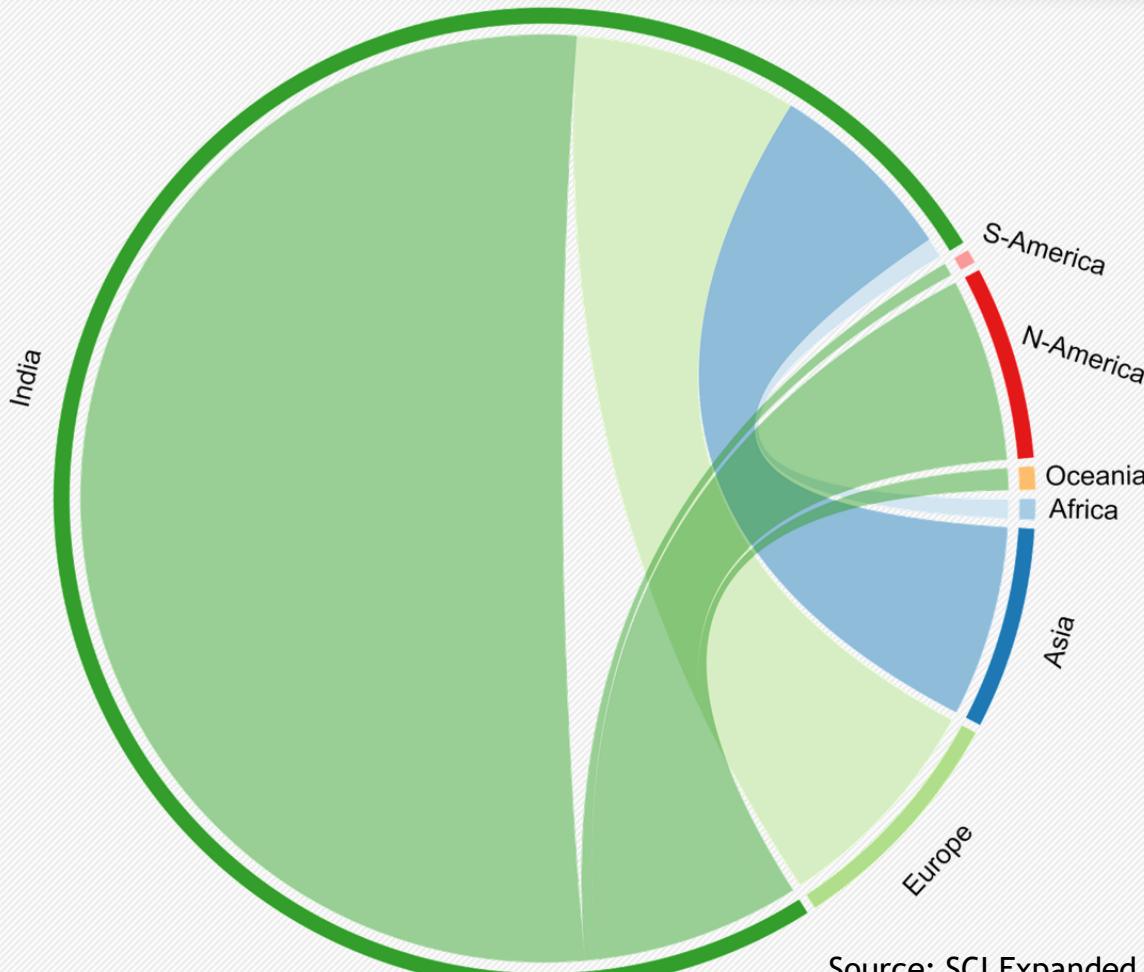
Global share of publications, collaborations, and citations, per country 1999-2014

(source: GEOINNO 2018, Barcelone -  
Maisonobe, Grossetti, Milard,  
Jégou, Eckert)

Top publishing countries in 2013	Publication share in 2013 - Publication share in 2000	Collaboration share in 2013 - Collaboration share in 2000	Citation share in 2013 - Citation share in 2000
United-States	-8.5	-6.5	-13.3
China	13	8.9	12.1
Japan	-4	-4	-3.5
Germany	-2.2	-2.1	-1.6
United-Kingdom	-3.1	-2	-2.4
India	1.5	-0.7	1.7
France	-1.8	-1.6	-1.1
Italy	-0.3	-0.2	0.3
South-Korea	1.5	1.2	1.6
Canada	-0.5	0.6	-0.4
Spain	0.2	1.3	0.8
Brazil	1.1	1.4	0.7
Australia	0.1	0.7	0.7
Russia	-1.3	0.6	-0.2
Taiwan	0.5	-0.2	0.6
Iran	1.5	-0.2	1
Turkey	0.9	0.9	0.5
Netherlands	-0.4	1.2	-0.3
Poland	0.4	-0.5	0.3
Switzerland	-0.3	-0.2	-0.4

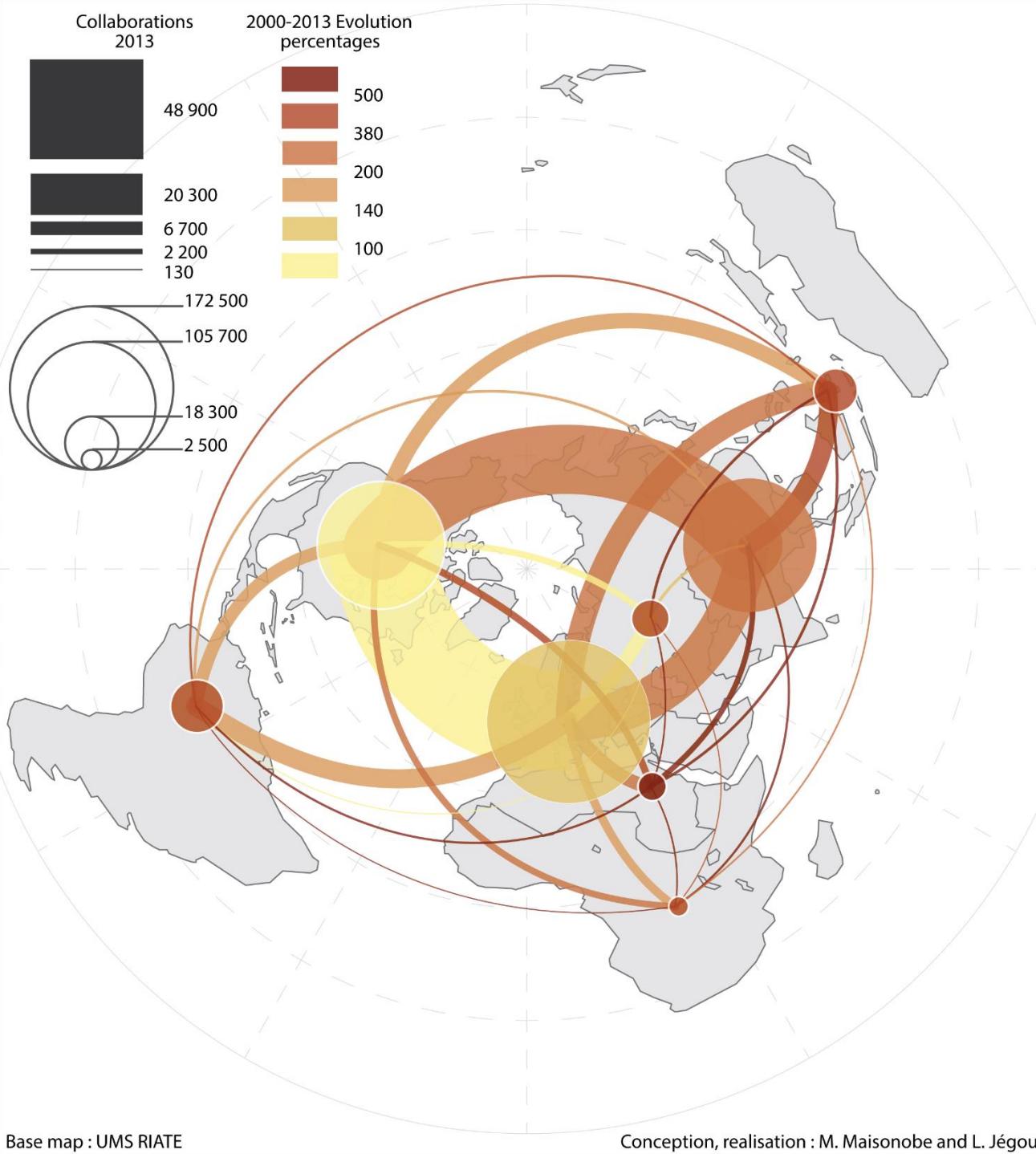
Source: Science Citation Index Expanded (articles, reviews and letters)

# Scientific collaboration of India with the rest of the world (2007-2015)



%	1999-2006	2007-2015
India (intra)	43.2	53.5
Europe	22.2	15.9
Asia	18.0	13.6
N-America	13.2	13.0
Oceania	1.5	1.6
Africa	1.1	1.4
S-America	0.8	0.9

Source: SCI Expanded (2007-2015). MM



Thank you  
for your attention!

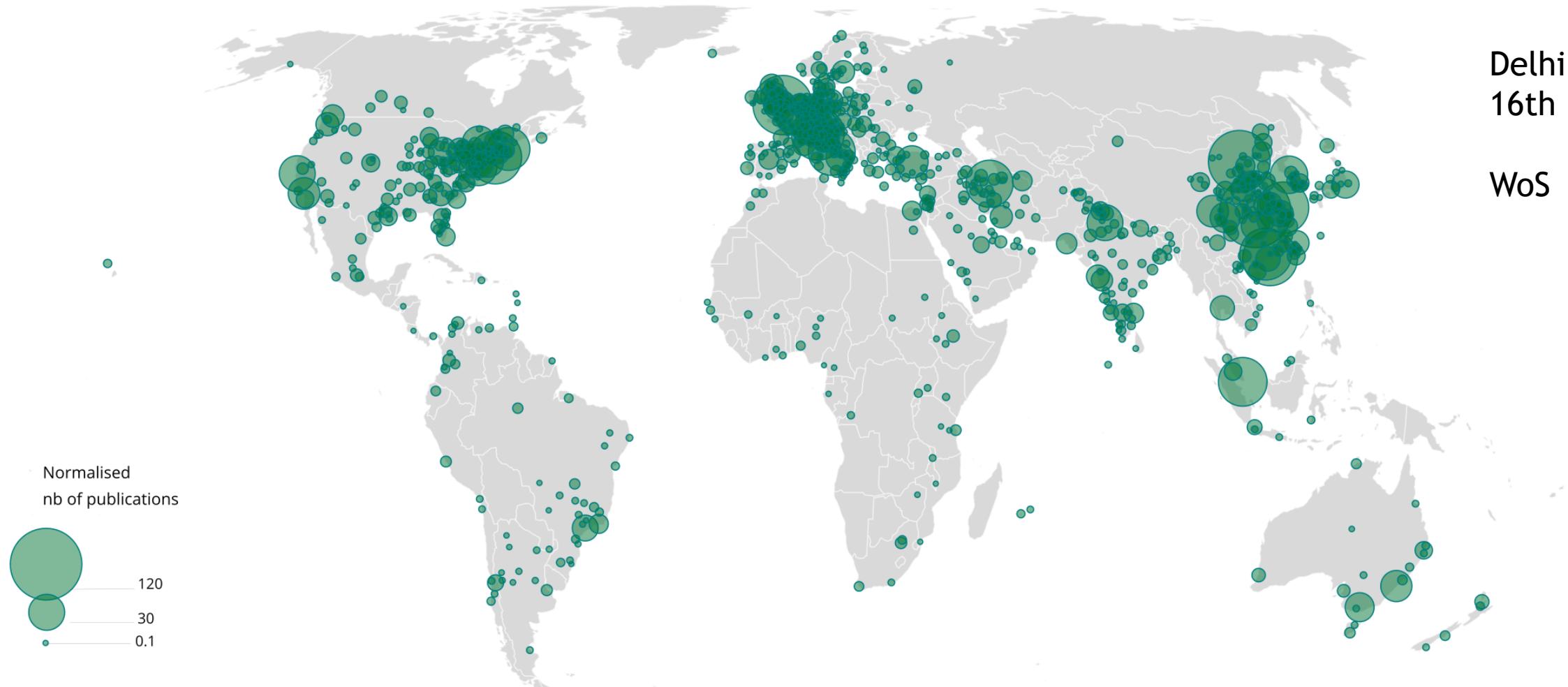
Map taken from  
Maisonobe *et al.*  
*La Revue Française  
De Sociologie*, 2016

# COVID-19 Scientific Production by urban area up until 2020-05-18

India  
5th rank

Delhi  
16th rank

WoS

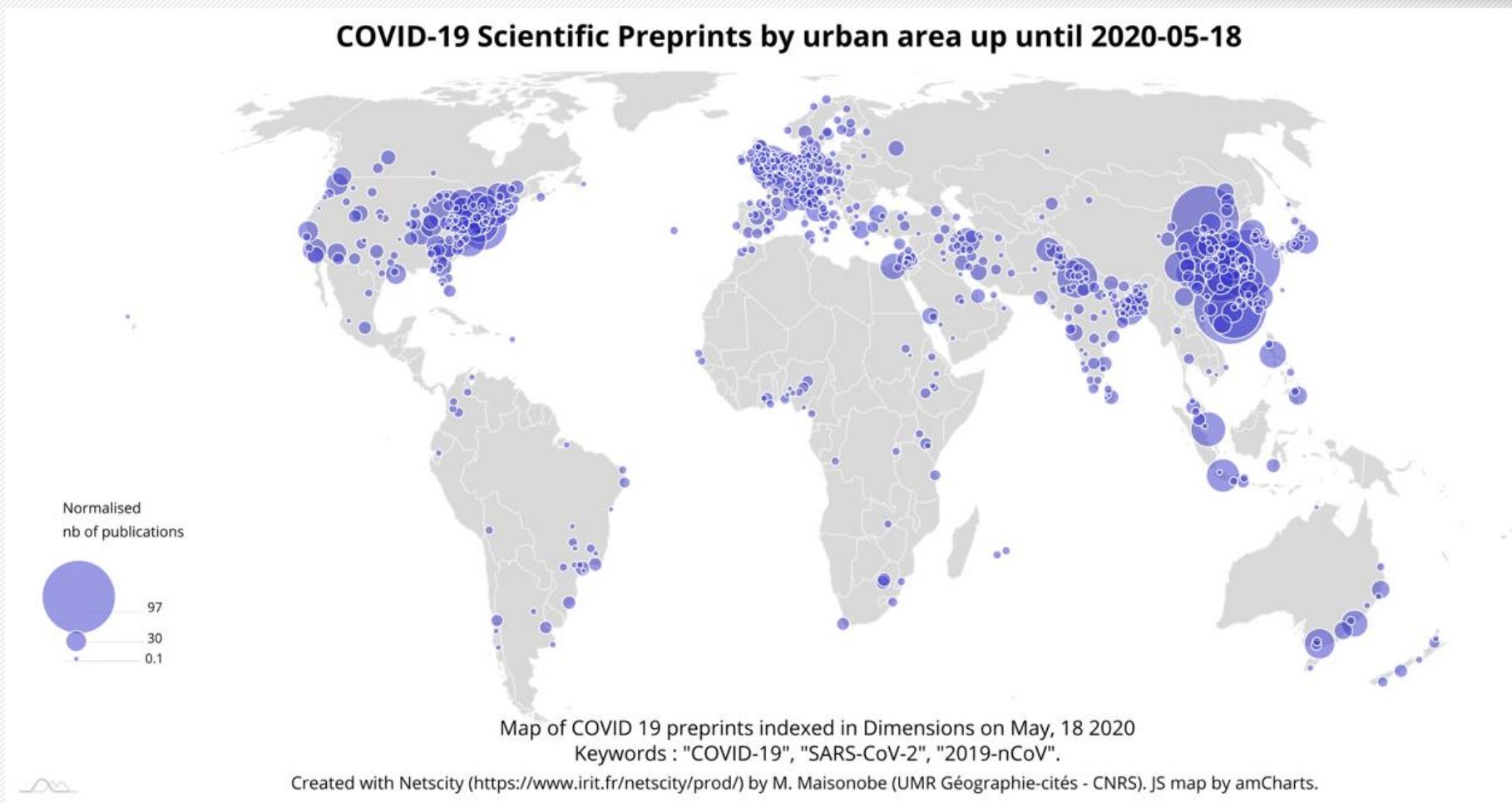


Map of COVID 19 publications indexed in the Web of Science (SCI-Expanded, CPCI-S, ESCI) on May, 18 2020  
Keywords (TS): "COVID-19", "SARS-CoV-2", "2019-nCoV".



Created with Netscity (<https://www.irit.fr/netscity/prod/>) by Marion Maisonobe (UMR Géographie-cités - CNRS). JS map by amCharts.

# Preprints on COVID-19



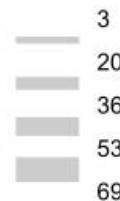
India  
5th rank

Delhi  
12th rank

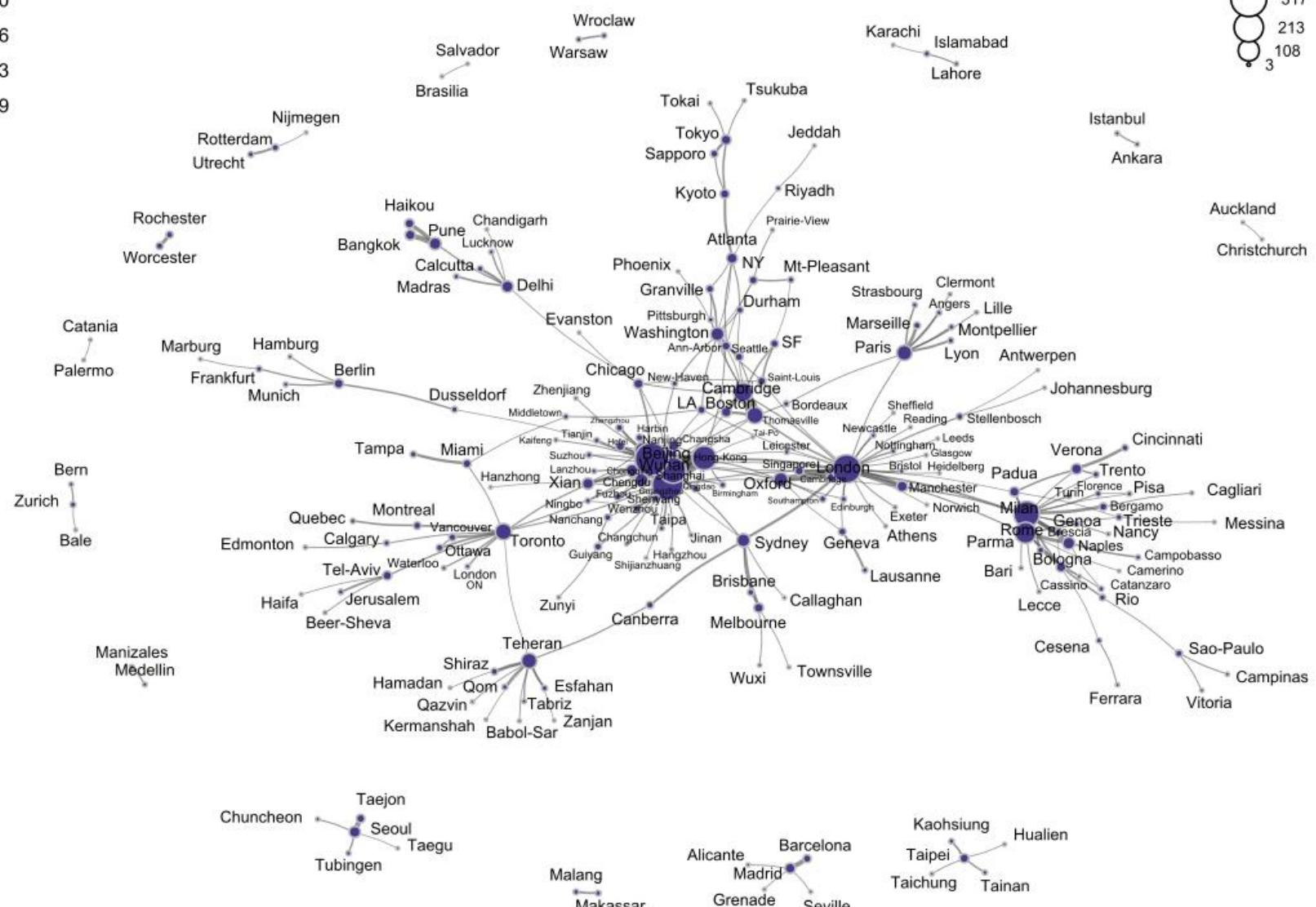
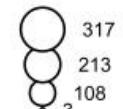
Dimensions

# Scientific network of interurban collaboration about COVID-19 up until 2020-05-18

Normalised nb of collaboration



Nb of collab. per city



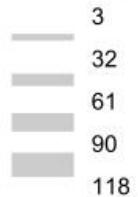
Graph of COVID 19 scientific collaborations indexed in Dimensions (Articles, Chapters and Preprints) on May, 18 2020.

Full data Query : 'COVID-19', 'SARS-CoV-2', '2019-nCoV'. Normalised number of collaborations > 3.

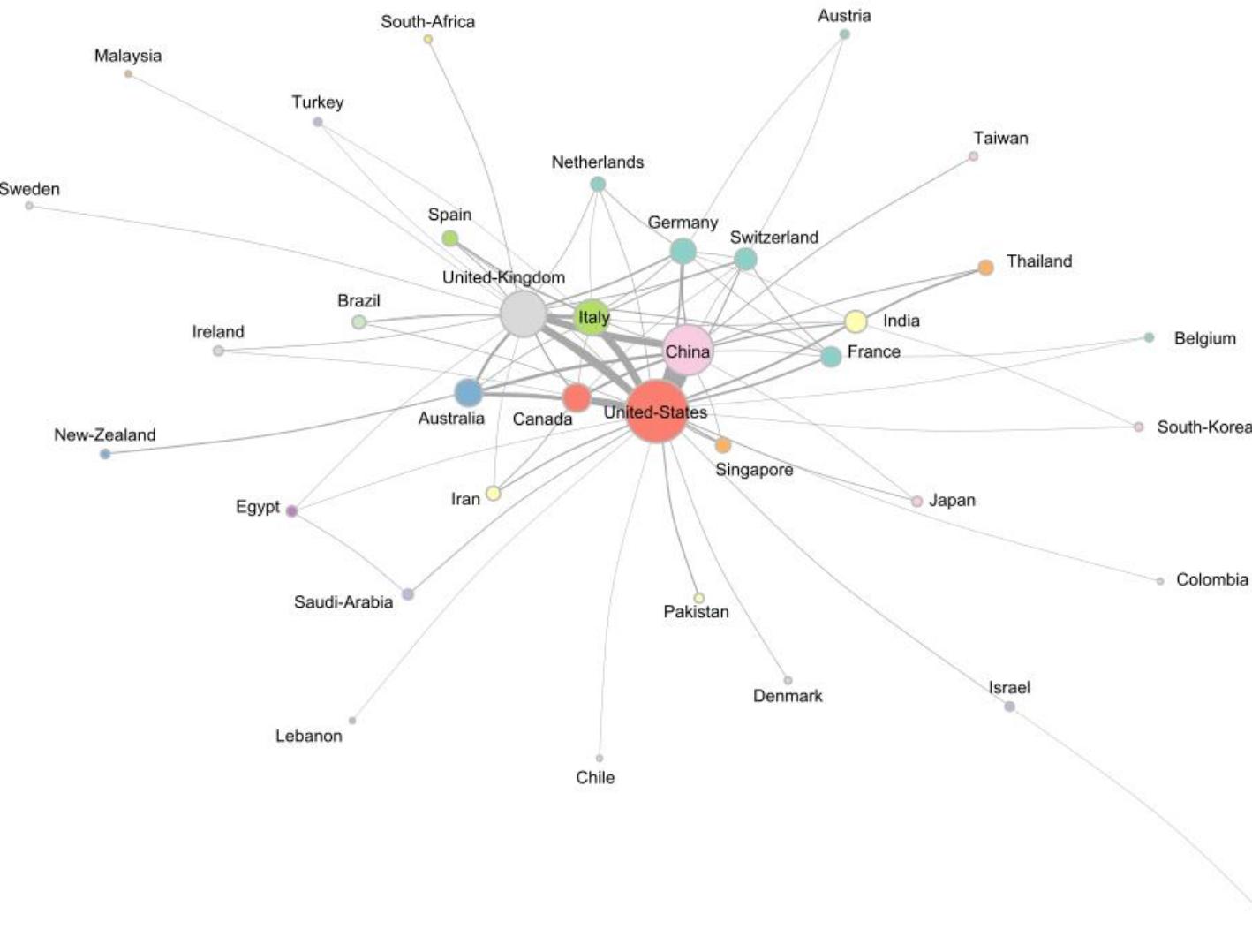
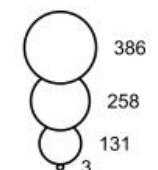
M. Maisonobe & G. Cabanac, 2020

## Scientific network of international collaboration about COVID-19 up until 2020-06-01

Normalised nb of collaboration



Nb of collab. per city

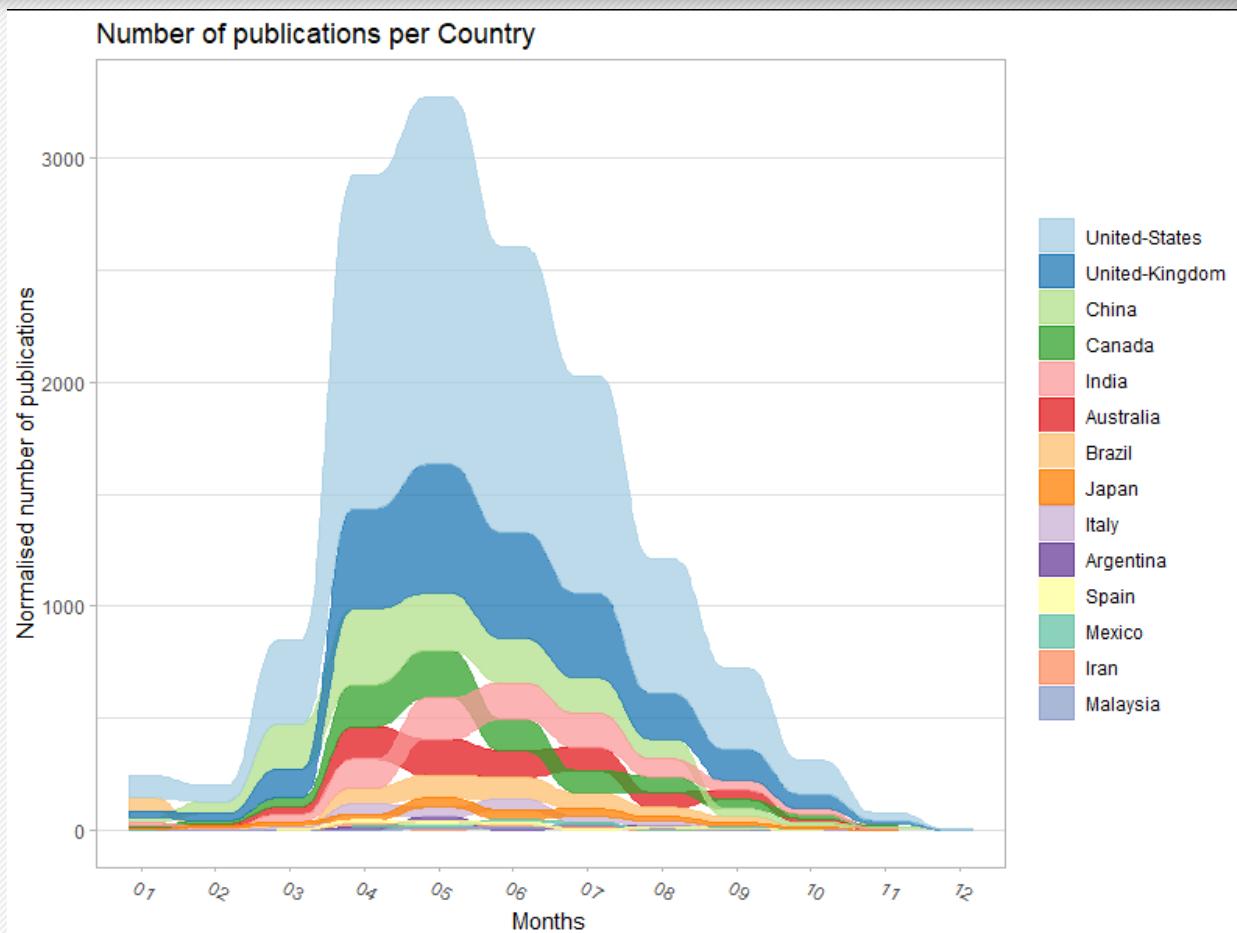


Graph of COVID 19 scientific collaborations indexed in the WoS (SCI-Expanded, CPCI-S, ESCI) on June, 1 2020.

TS Query : 'COVID-19', 'SARS-CoV-2', '2019-nCoV'. Links' value >= 3. Colors correspond to world regions (M49 standard - UN).

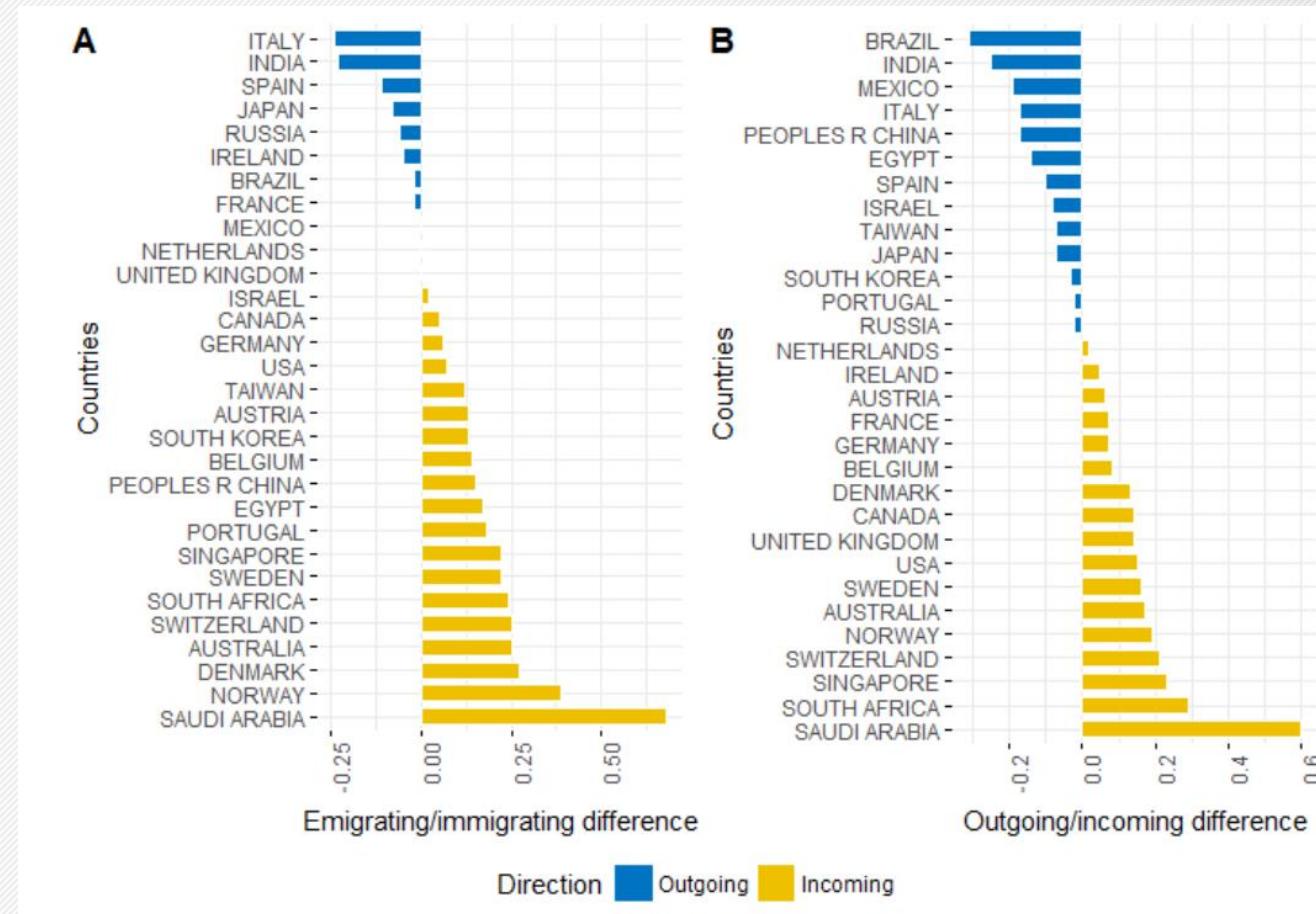
M. Maisonneuve, 2020

# Number of publications on COVID-19 up until December 2020 (retrieved on January 2021)



M. Maisonobe, L. Jégou & G. Cabanac, ongoing work,  
data processed with NETSCITY. See:  
<http://geoscimo.univ-tlse2.fr/where-do-covid-19-researches-come-from/>

# Mobility pattern (2008-2015)

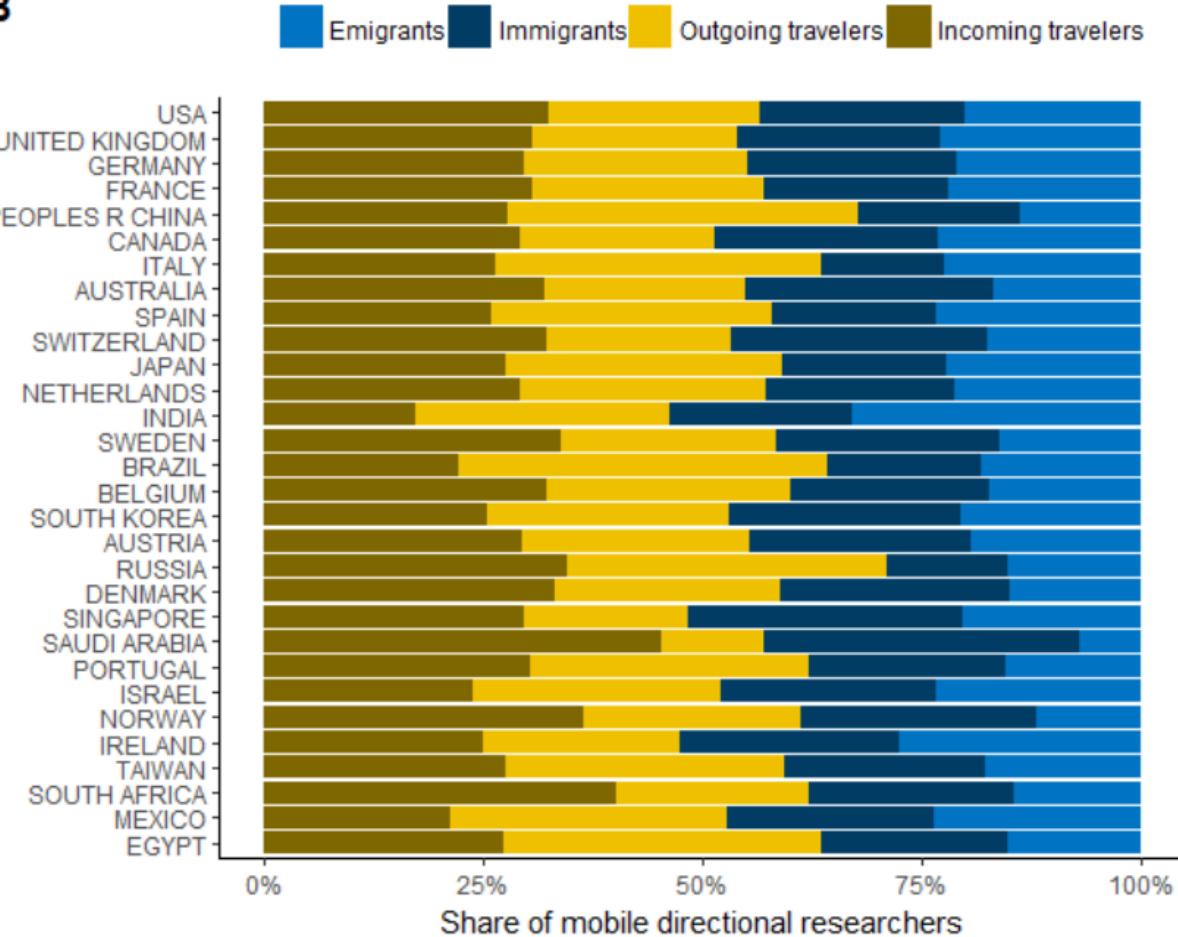


Robinson-Garcia et al., 2018  
The many faces of mobility:  
Using bibliometric data  
to measure the movement of scientists

Source: WoS Core Collection

# Mobility pattern (2008-2015)

B



Robinson-Garcia et al., 2018

The many faces of mobility:  
Using bibliometric data  
to measure the movement of scientists

Source: WoS Core Collection