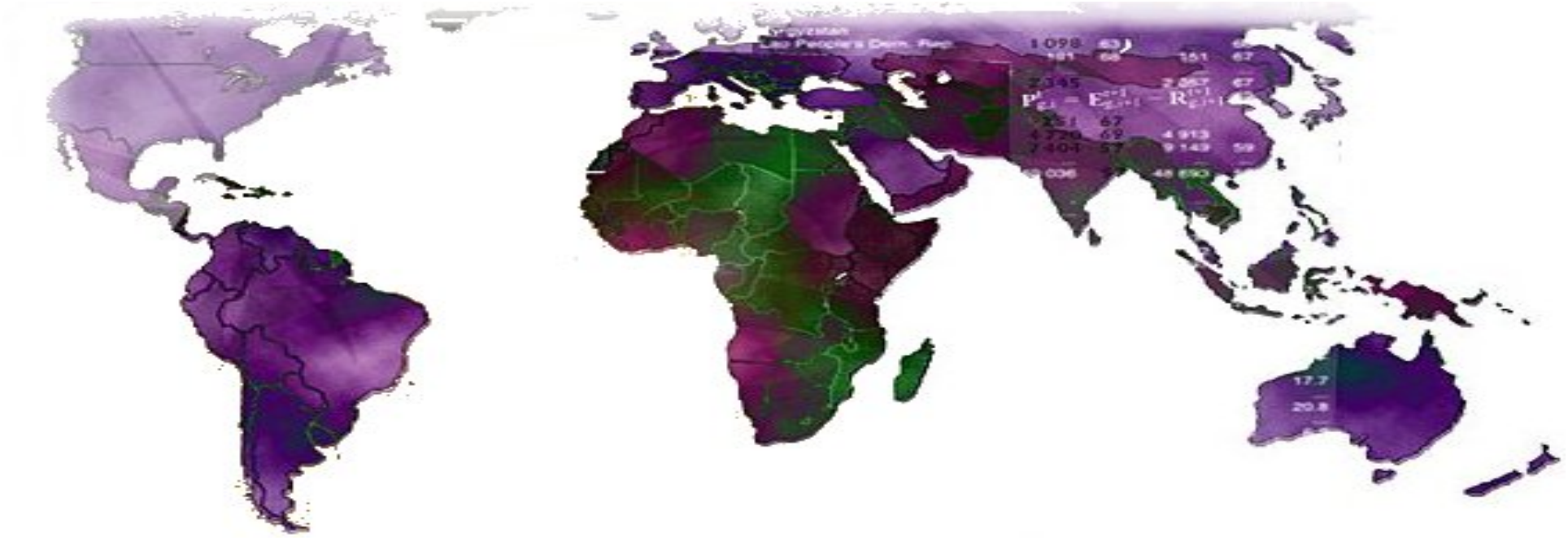

Core ICTs in education Indicators: a proposal by the UNESCO Institute for Statistics

Geneva, 27 May 2008

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UNESCO

INSTITUTE *for* STATISTICS

The UNESCO Institute for Statistics (UIS): an overview

- Created in 1999 as successor to the former UNESCO Division of Statistics
- Moved from UNESCO HQ – Paris to its current location in Montreal in 2001
- A semi-independent entity:
  - with its own Governing Board that fix its priorities on annual basis
  - with around 100 staff members (approx. ¾ in Montreal and ¼ in Asia, Africa and LAC)
- Its responsibility includes:
  - Guardianship of cross-nationally comparable statistics required for monitoring progress towards international goals in Education, Science, Culture and Communication;
  - Development of appropriate methodologies for new indicators and improvement of existing indicators;
  - Capacity building of countries for data collection, use and analysis through training and advisory services;
  - Dissemination of cross-national data, indicators and analytical reports to inform international policy development and monitoring.

The UIS and its role within the Partnership

- Contribute to the work of the Partnership for Measuring ICT4D in monitoring the Action Plan of WSIS (Geneva 2003 and Tunis 2005)
  - More specifically, lead the Task Group on Education made up of ECA, ECLAC, ESCWA, OECD, Eurostat for:
    - the identification of a core set of indicators for measuring the use of ICTs in Education
    - the organization of a systematic programme of regional consultation on the core indicators and other area of ICTs in education
    - the publication of the core indicators through the Partnership
    - the identification of potential; data sources for indicators, data collection instruments, definitions and methodologies, and
    - developing an Action Plan to support countries in the collection of relevant ICT indicators in education

The policy framework

- Benchmarking and monitoring the following international policy goals and targets:
  - WSIS Geneva 2003, Tunis 2005:
    - B6b. to connect universities, colleges, secondary schools and primary schools with ICTs;
    - B6g. to adapt all primary and secondary school curricula to meet the challenges of the Information"
  - Millennium Development Goals - MDGs
    - Target 18: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications."

Conceptual, analytical and operational frameworks

Why indicators for ICTs in education?

- It is illusory to expect meeting by 2015 the international educational Goals (of MDGs, or EFA, WSIS…) by the sole means of the conventional education delivery model
- The Information Age and ICTs as a tremendous opening for a rapid and qualitative expansion of lifelong learning opportunities beyond all barriers (physical, cultural…) by reaching out traditionally marginalized groups (girls/women, geographically dispersed populations, adult workers, disables and other minorities)
- Yet, few or inconclusive hard evidence exists on the expected benefits or impacts of ICTs on educational outcomes
- But investment in ICTs are relatively costly…; thus inhibiting policy-makers enthusiasm, especially in the developing World where the educational challenges remain greatest…

Conceptual, analytical and operational frameworks (cont'd)

- **Monitoring trends of the paradigm shift in teaching-learning and versatile skills demand in the Information Age:**
  - **Tracking new generation of "learners without frontiers" or "virtual learners" studying beyond the limits of a country or beyond the confines of traditional classrooms (distance education or e-learning statistics)**
  - **Tracking the differential impact of learner-centric self-tutoring emerging models versus the traditional magister-centric approach on learning achievements (PISA studies)**
  - **Tracking the efficiency on the labour-market of the growing "learner-packaged" skill formation out of conventional curricula or certification path (Tracer studies).**

Conceptual, analytical and operational frameworks (cont'd)

- **What is the focus for measuring ICTs in education ?**
  - **Existing studies tend to indicate that the fastest growing segment of ICTs in education is management or administration of educational institutions but the prime focus here is about:**
    - **ICTs as self-learning aid for both teachers and learners**
    - **ICTs as support tools for curricula delivery**
    - **ICTs as subject taught**
  - **The range of ICTs concerned is not limited to newer ICTs but also older ones:**
    - **Radio, Television, Video, Computer, and Internet (major ones)**

Conceptual, analytical and operational frameworks (cont'd)

How is the measurement foreseen?

- Maximization of response from all countries regardless capacity constraints by selection of most reasonable and feasible set of core indicators
- Minimization of the data collection burden on national statistical systems by simple addition a limited new items into existing national data collections instruments, rather than implementation of completely new and resource-driven surveys
- Avoidance of duplication of data collection sources on education within countries (NSOs vs MOEs)
- Sustainability of international data collection efforts by privileging administrative data sources
- Alignment of the core indicators with the state of knowledge on proven benefits of ICTs in education
- Promotion of set policy-relevant of core indicators at global level (MDGs, EFA and WSIS)

Core indicators selection process informed by:

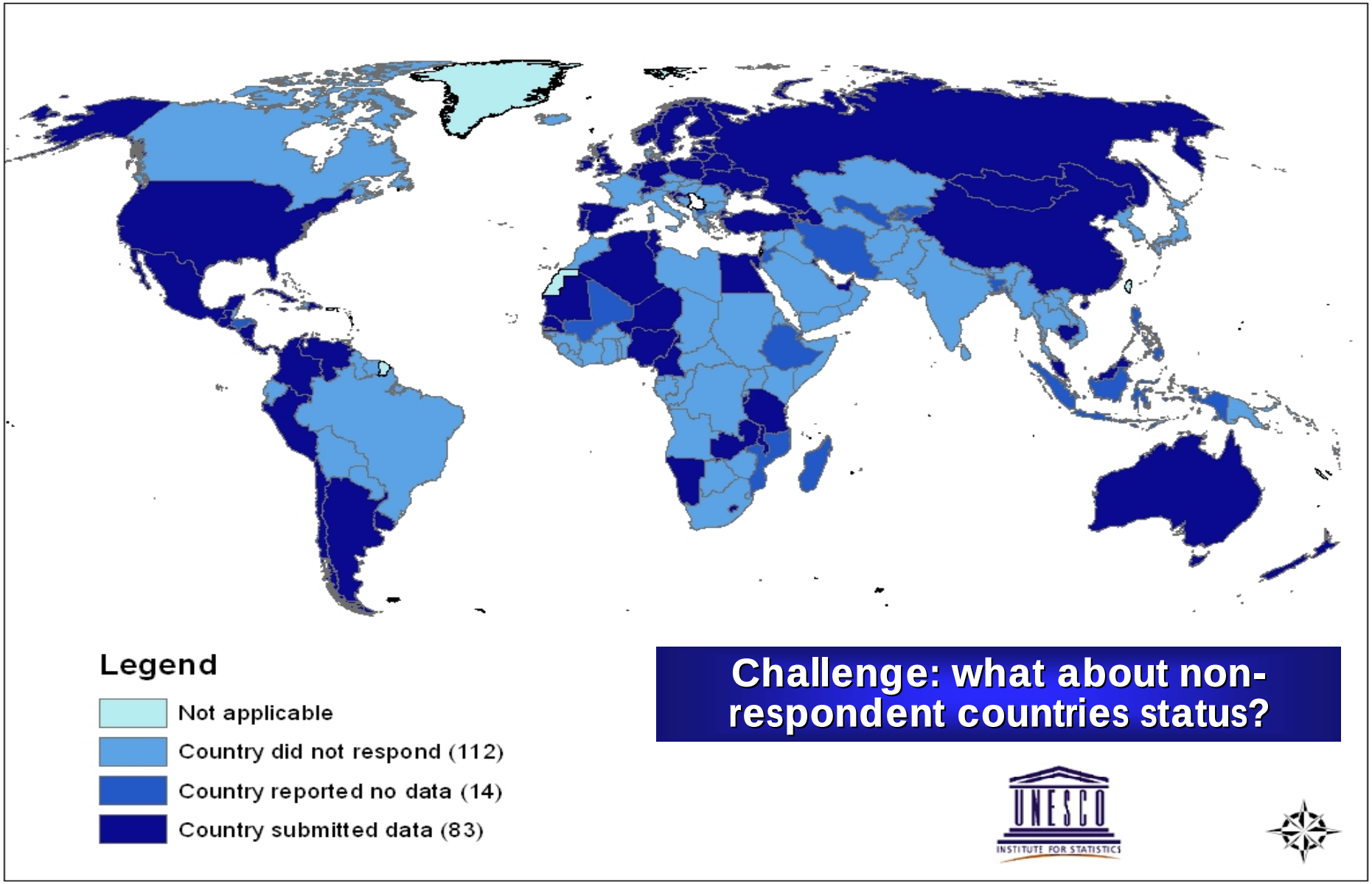
- The review of ICT items in various international schools surveys to derive a minimum common list
- A series of regional consultations: Bangkok (26-28 July 2006), Panama, (22-24 November 2006), Cairo (13-15 February 2007), Addis Ababa (3-7 December 2007)…
- The review of key regional stakeholders imperatives on Information Society indicators' development
- The conduct of a worldwide scoping survey

UIS proposed Basic Core of Indicators for ICT in Education

Basic core indicators	
ED1	Percentage of schools with electricity (by ISCED* level 1 to 3)
ED2	Percentage of schools with radio set used for educational purposes (by ISCED level 0 to 4)
ED3	Percentage of schools with television set used for educational purposes (by ISCED level 0 to 4)
ED4	Student-to-computer ratio (by ISCED level 0 to 4)
ED5	Percentage of schools with basic telecommunication infrastructure or telephone access (by ISCED level 1 to 3)
ED6	Percentage of schools with an Internet connection (by ISCED level 1 to 3)
ED7	Percentage of students who use the Internet at school (by ISCED level 0 to 4)
Extended core indicators	
ED8	Percentage of students enrolled by gender at the tertiary level in ICT-related fields (ISCED levels 5 to 6)
ED9	Percentage of ICT-qualified teachers in primary and secondary schools (of the total number of teachers)

** ISCED refers to the UNESCO International Standard Classification of Education levels of 1997*

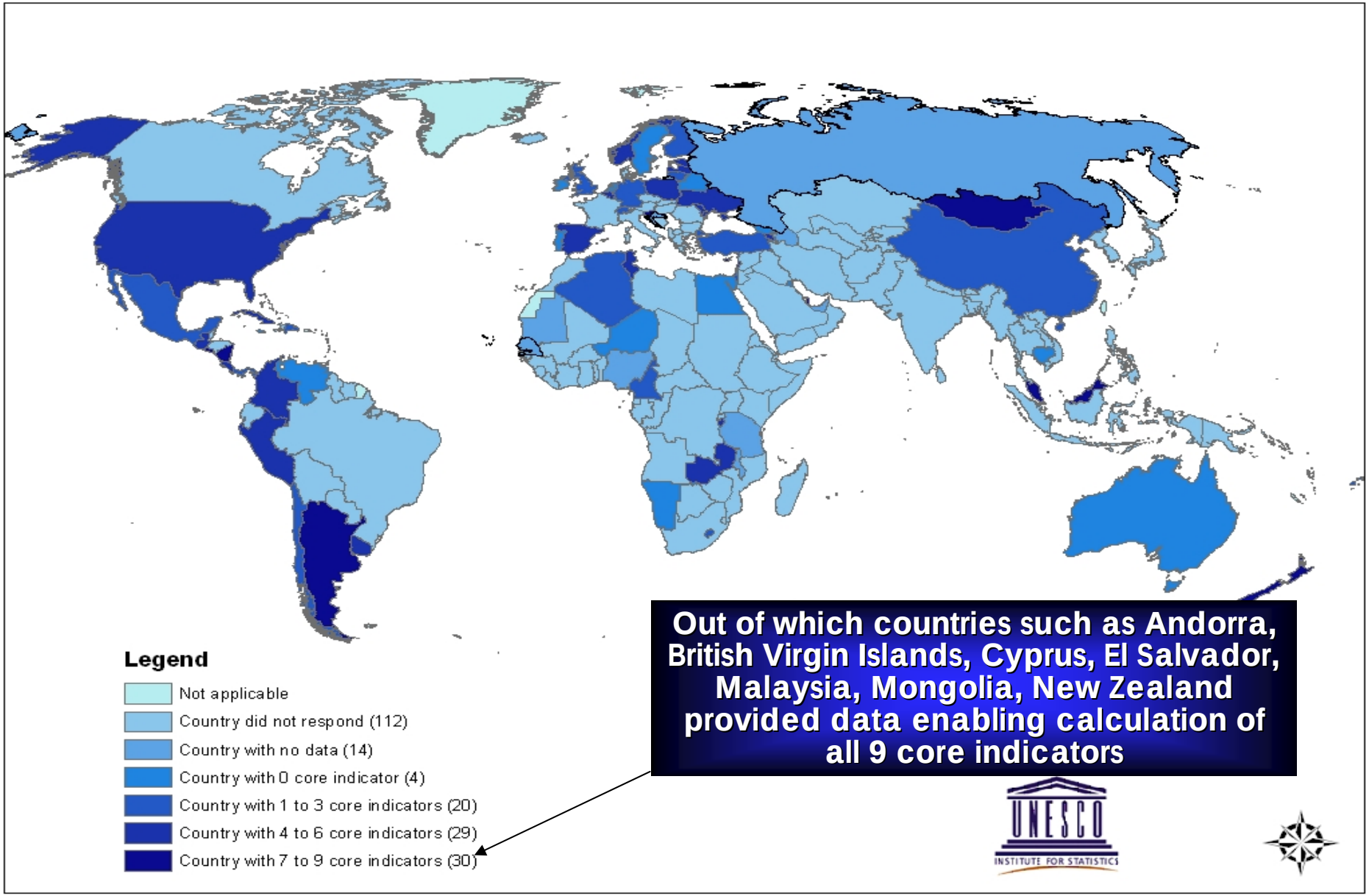
Response status to the UIS scoping survey



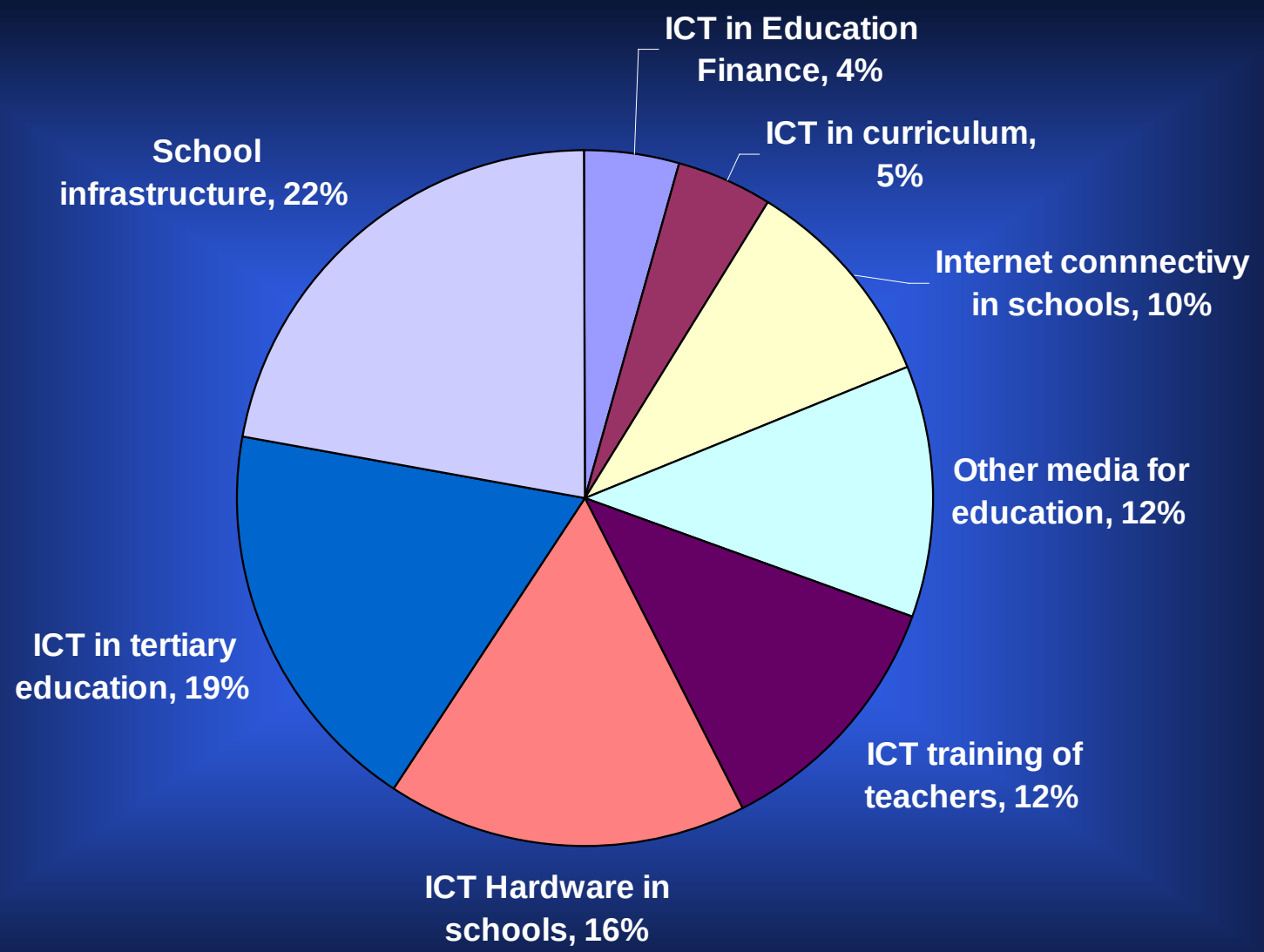
Summary of core indicators availability by economic and geographic groups

Country groups	Core indicator label									Total number of countries
Economic group	**ED1**	**ED2**	**ED3**	**ED4**	**ED5**	**ED6**	**ED7**	**ED8**	**ED9**	
Developed economies	20	5	4	12	19	15	11	16	5	21 (40)
Developing economies	38	16	24	33	37	38	28	19	34	50 (100)
Least-developed economies	7	3	3	2	3	1	1	4	1	16 (50)
Transition economies	4	1	2	4	4	3	3	1	4	10 (19)
Geographic group	**ED1**	**ED2**	**ED3**	**ED4**	**ED5**	**ED6**	**ED7**	**ED8**	**ED9**	
Africa	12	4	5	4	8	6	3	6	2	21 (54)
Asia	16	5	9	11	14	12	8	9	15	25 (50)
Europe	19	5	4	13	18	15	11	14	6	23 (45)
Latin America and the Caribbean	18	9	13	21	19	21	19	8	20	24 (40)
Northern America	1	0	0	1	1	1	1	1	0	1 (3)
Oceania	3	2	2	1	3	2	1	2	1	3 (17)
Total	69	25	33	51	63	57	43	40	44	97 (209)

Status of core indicators availability by country

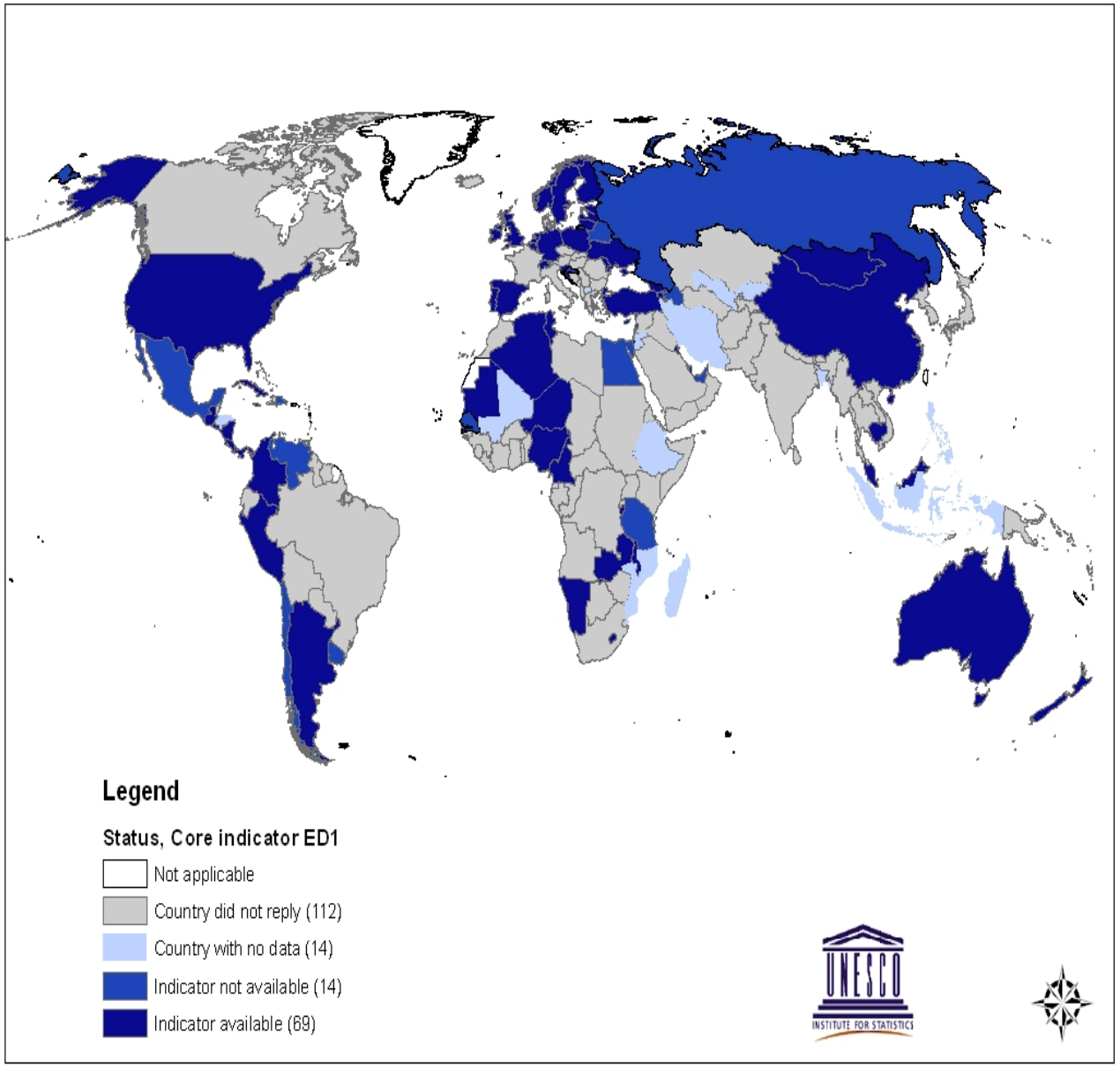


Response frequency by major data categories



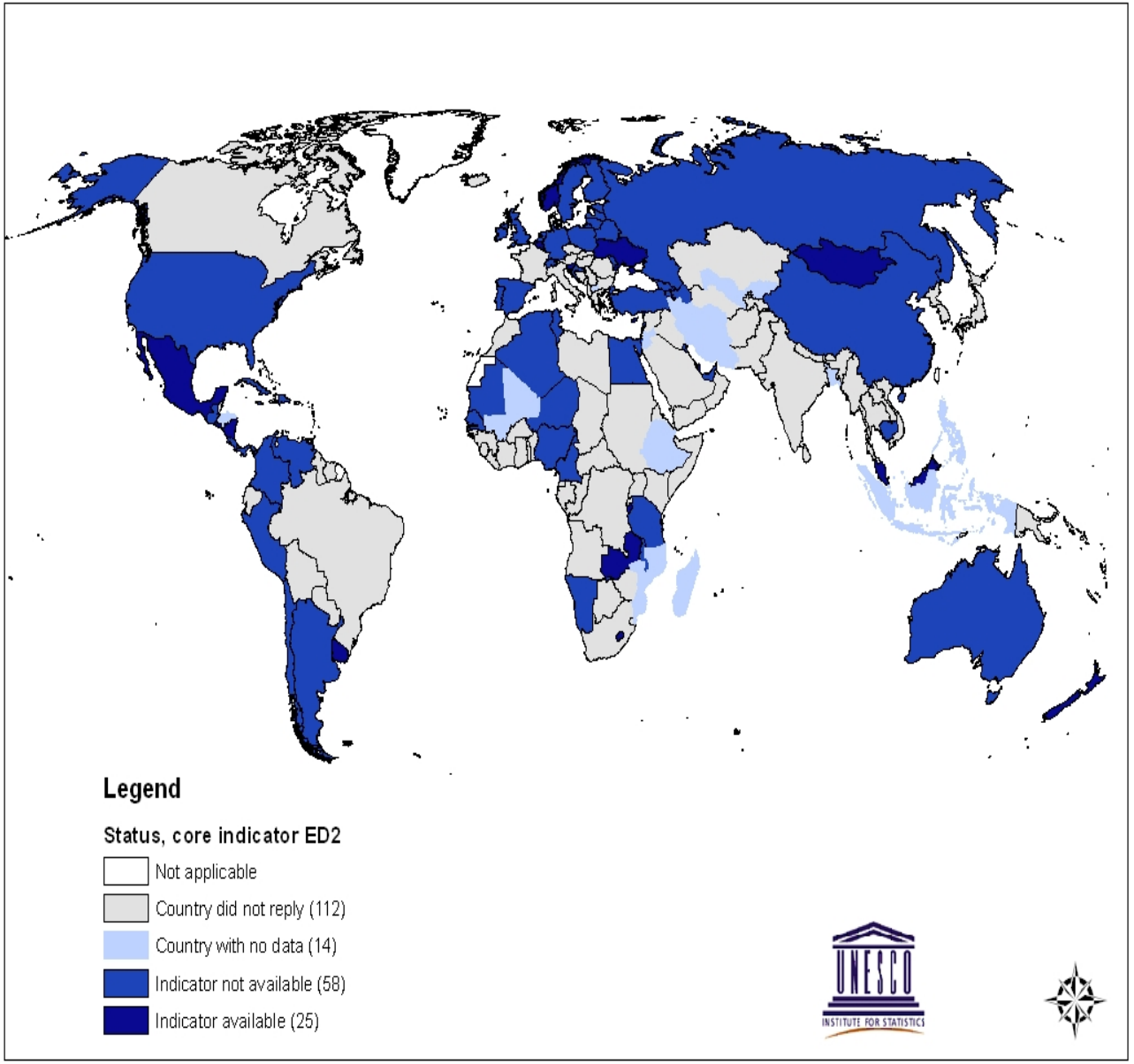
Overview on the core indicator measurement: ED1 (% of schools with electricity)

- Definition: Schools with electricity as a percentage of the total number of schools in the country for each ISCED level (1-3)
- Purpose: To measure the availability of a minimum pre-requisite condition for ICTs to be introduced to schools
- Data requirement:
  - Total number of both public and private schools with electricity at ISCED levels 1 to 3
  - Total number of both public and private schools at ISCED levels 1 to 3
- Remarks: Very strategic to monitor for majority of developing countries and policy-irrelevant for all advanced countries



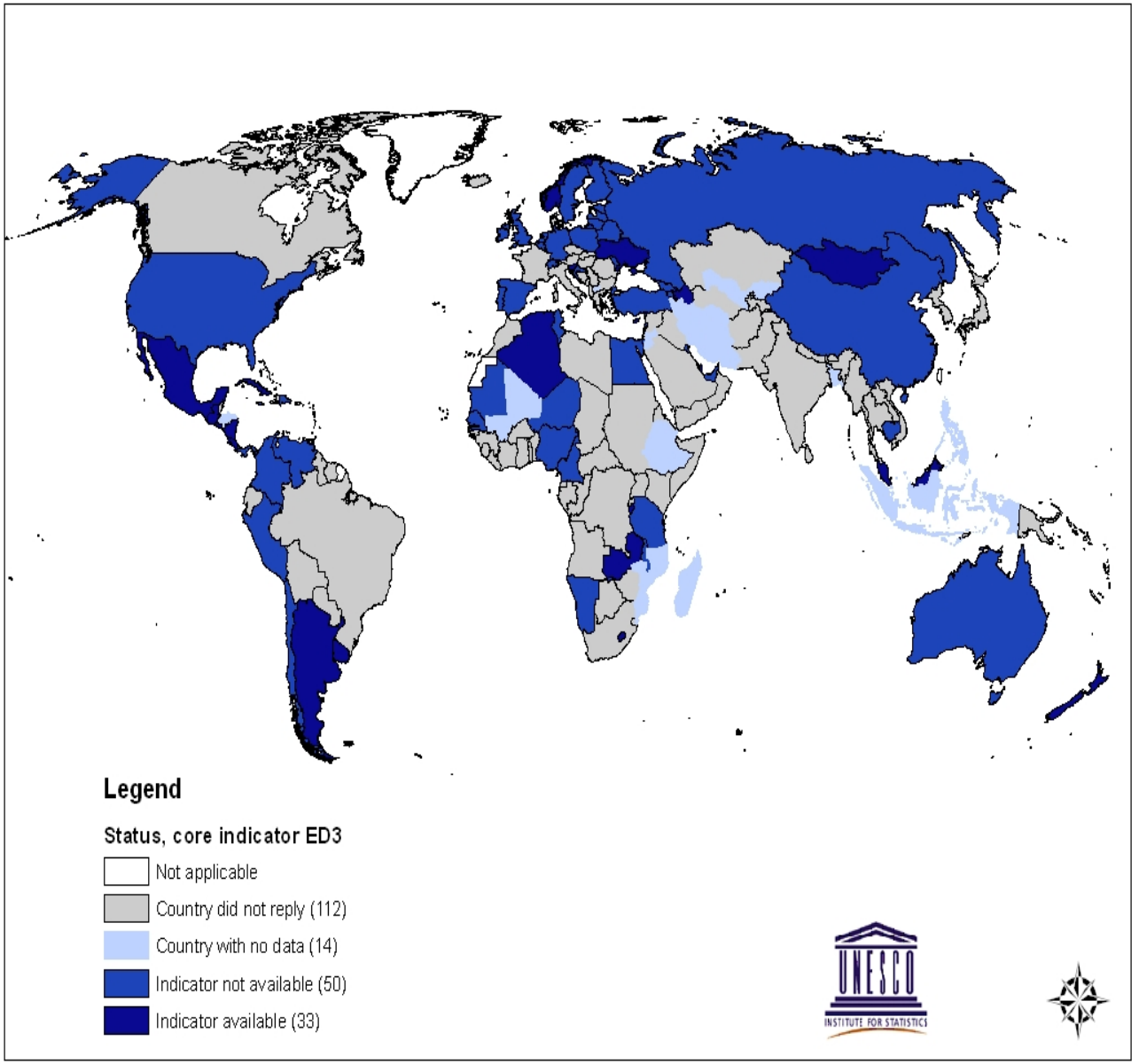
Overview on the core indicator measurement: ED2 (% of schools with radio based instruction)

- Definition: Schools offering radio based education as a percentage of the total number of schools in the country for each ISCED level (0-4).
- Purpose: To measure the overall presence of radio-based education in schools.
- Data requirement:
  - Total number of both public and private schools providing radio-based education at ISCED levels 0 to 4.
  - Total number of both public and private schools at ISCED levels 0 to 4.
- Remarks: Emphasis is on programme delivered through radio rather than the device itself. An affordable model of ICT use and very useful to monitor for majority of developing countries



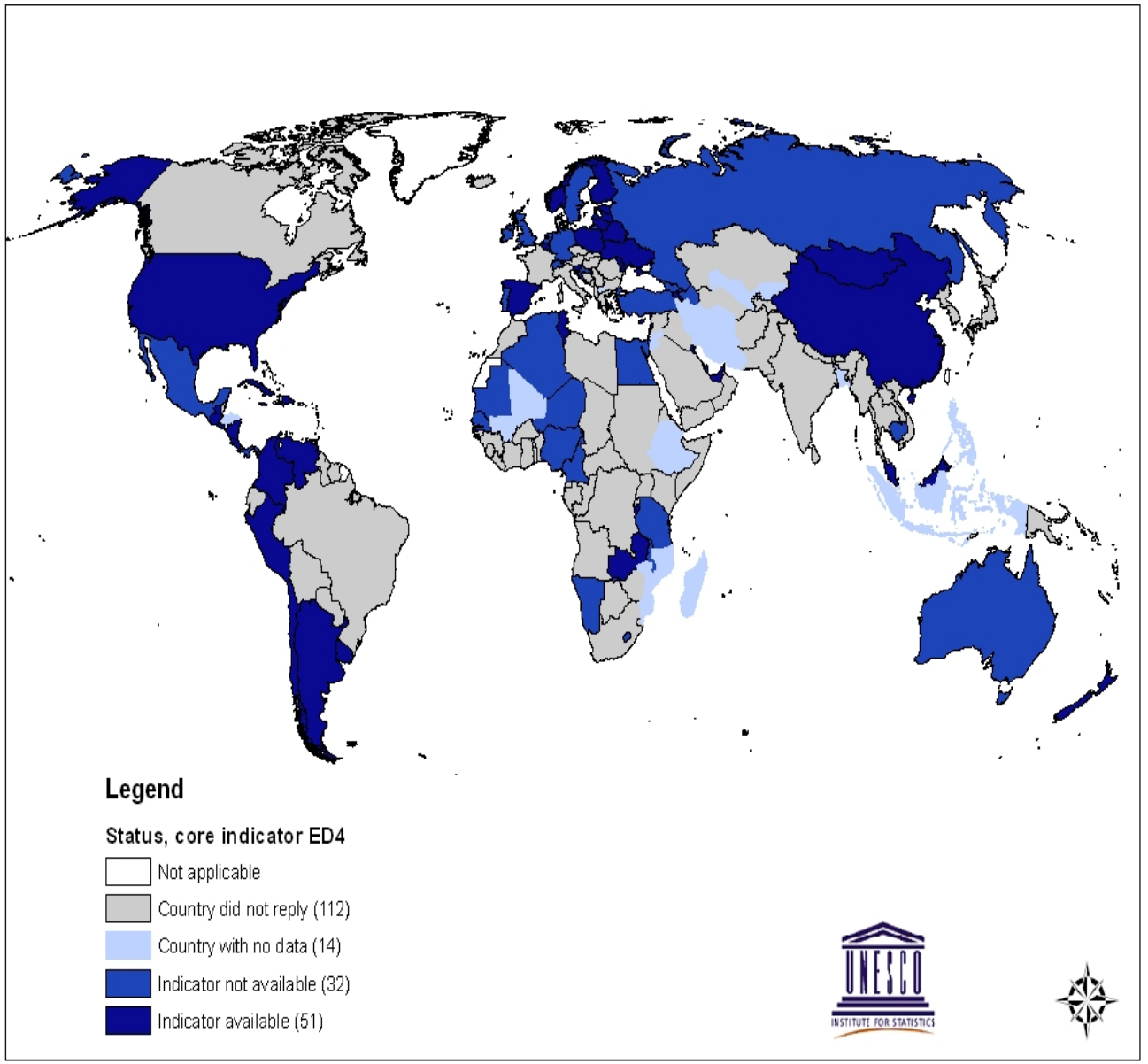
Overview on the core indicator measurement: ED3 (% of schools with television based instruction)

- Definition: Schools offering television-based education as a percentage of the total number of schools in the country for each ISCED level (0-4).
- Purpose: To measure the overall presence of television-based education in schools.
- Data requirement:
  - Total number of both public and private schools providing television-based education at ISCED levels 0 to 4.
  - Total number of both public and private schools at ISCED levels 0 to 4.
- Remarks: Emphasis is on programme delivered through radio rather than the device itself. An affordable model of ICT use and very useful to monitor for majority of developing countries



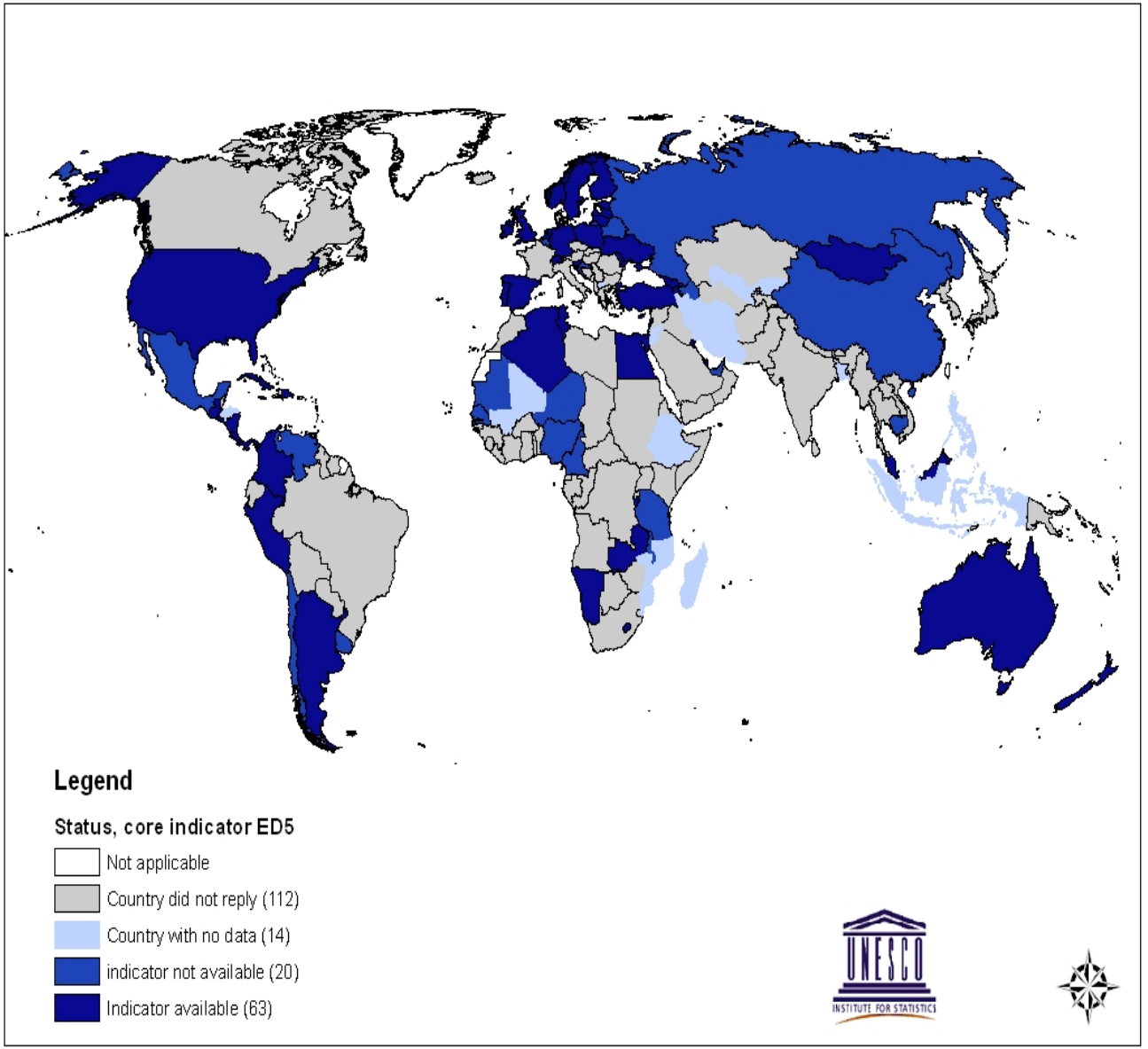
Overview on the core indicator measurement: ED4 (student-to-computer ratio)

- **Definition: Average number of students per computer in schools that offer computer-assisted instruction (CAI) by each ISCED level (0-4).**
- **Purpose: To measure the possibilities available for the use computers in schools to promote or expand computer-assisted instruction.**
- **Data requirement:**
  - **Total number of students enrolled in grades where computer-assisted instruction is officially offered in schools of a given country by each ISCED level (0-4).**
  - **Total number of computers for students' use only in schools providing computer-assisted instruction (CAI) by each ISCED level (0-4)**
- **Remarks: Calculation is focused only on data for students, grades and schools concerned with the use of computer-assisted instructions**



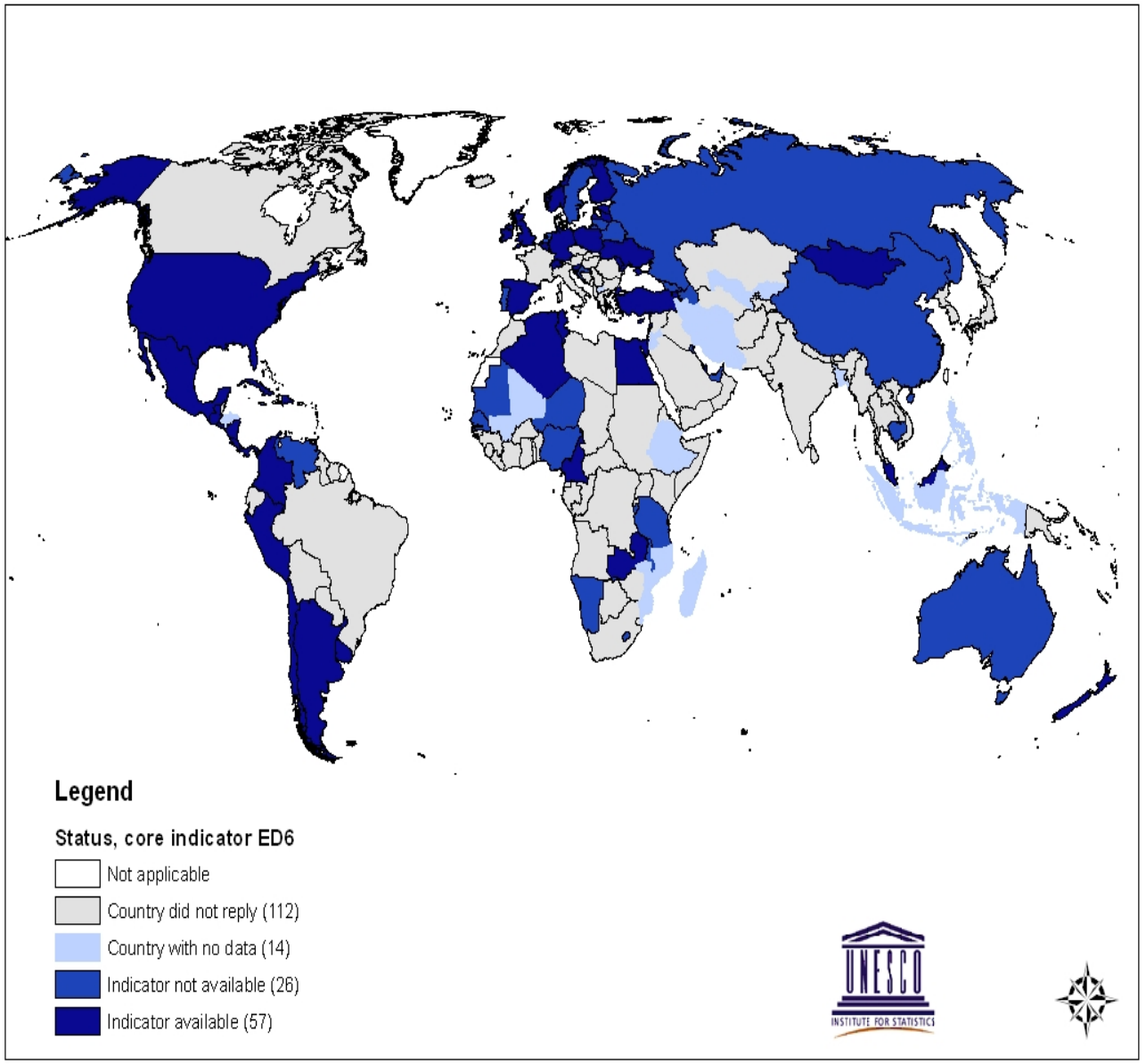
Overview on the core indicator measurement: ED5 (% of schools with telephone)

- Definition: Schools with telephone communication facilities as a percentage of the total number of schools in the country for each ISCED level (1-3).
- Purpose: To measure the availability of minimum pre-requisite conditions for Internet accessibility in schools.
- Data requirement:
  - Total number of both public and private schools with telephone communication facilities at ISCED levels 1 to 3.
  - Total number of both public and private schools at ISCED levels 1 to 3.
- Remarks: Very strategic to monitor for majority of developing countries as enabling condition for the WSIS connectivity targets



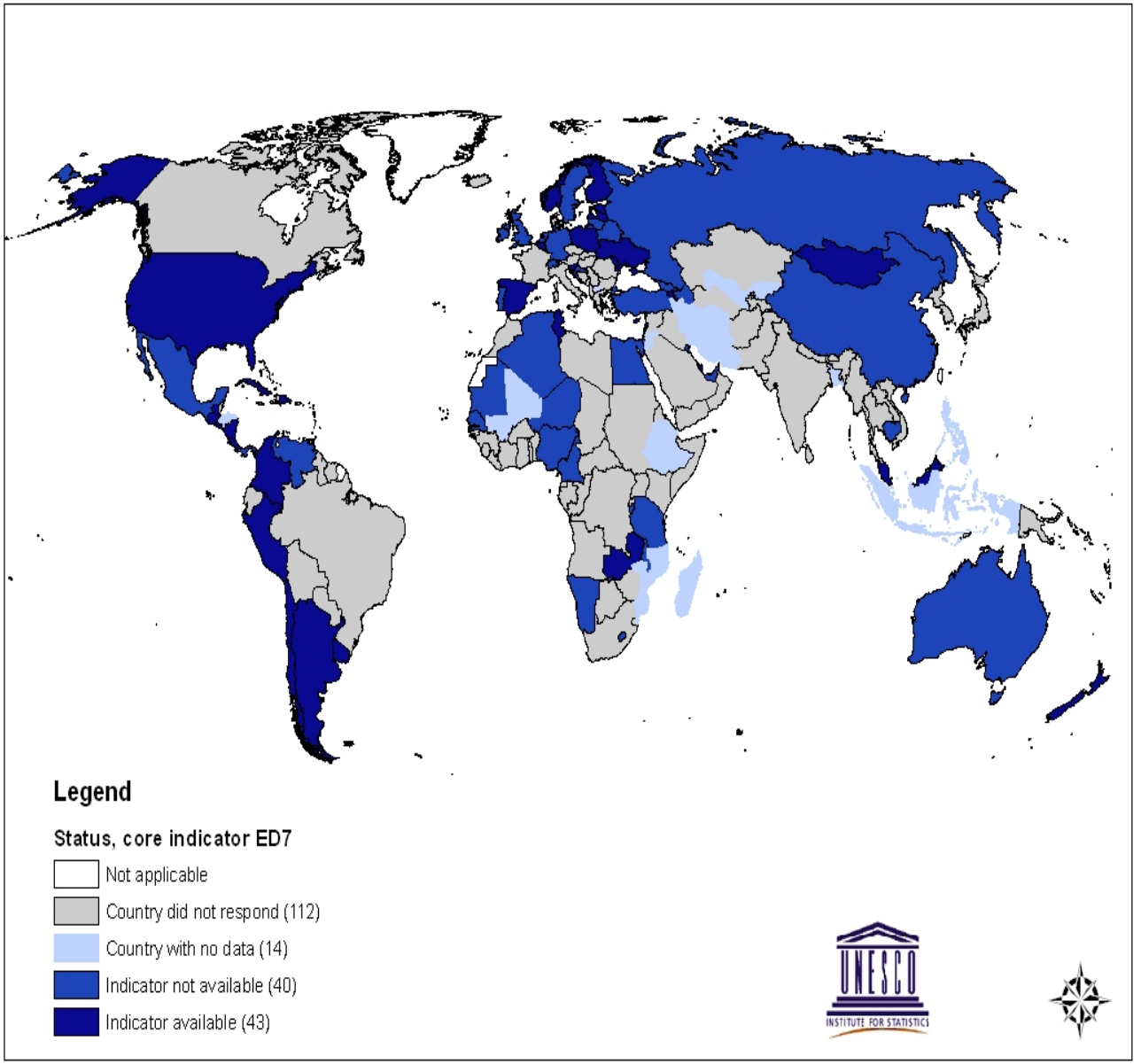
Overview on the core indicator measurement: ED6 (% of schools with internet)

- **Definition: Schools with access to the Internet as a percentage of the total number of schools in the country for each ISCED level (0-4).**
- **Purpose: To measure the overall presence of the Internet in schools.**
- **Data requirement:**
  - **Total number of both public and private schools providing Internet access at ISCED levels 1 to 3.**
  - **Total number of both public and private schools at ISCED levels 1 to 3.**
- **Remarks: Not a measure of actual usage. Emphasis is on availability for educational purposes and not administrative or management usage.**



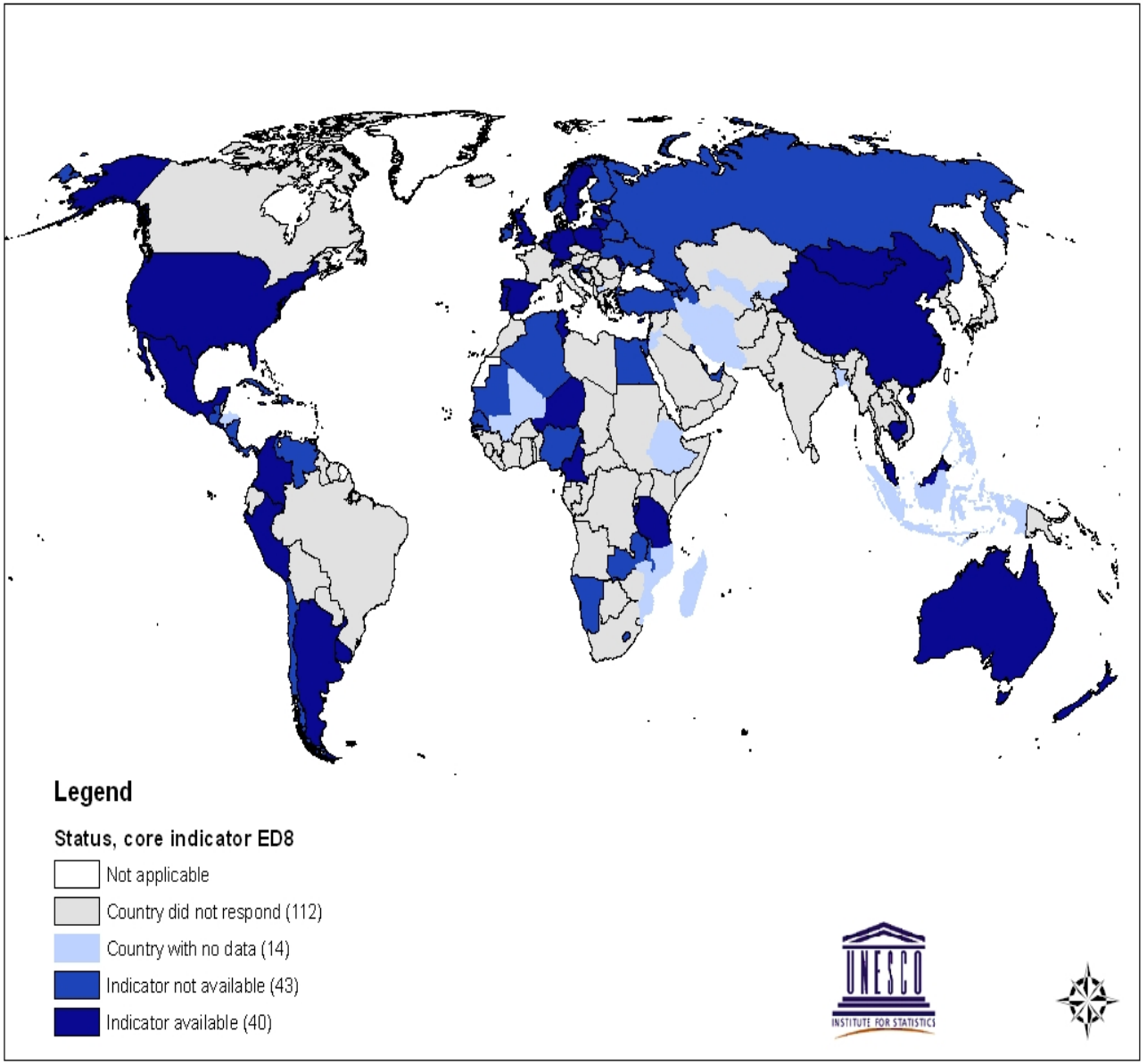
Overview on the core indicator measurement: ED7 (% student using internet)

- **Definition: Total number of students with access to the Internet in schools as percentage of the total number of students in schools for a given country by each ISCED level (0-4).**
- **Purpose: To measure the accessibility to Internet use for educational purposes by students.**
- **Data requirement:**
  - **Total number of students enrolled in grades where Internet accessibility is offered and scheduled in the school curricula of a given country by each ISCED level (0-4).**
  - **Total number of students enrolled only in the schools providing Internet access to students for educational purposes in a country by each ISCED level (0-4).**
- **Remarks: Sensitive to national norms in terms of students' grade(s) or age for access to internet at school. Comparability still to be refined.**



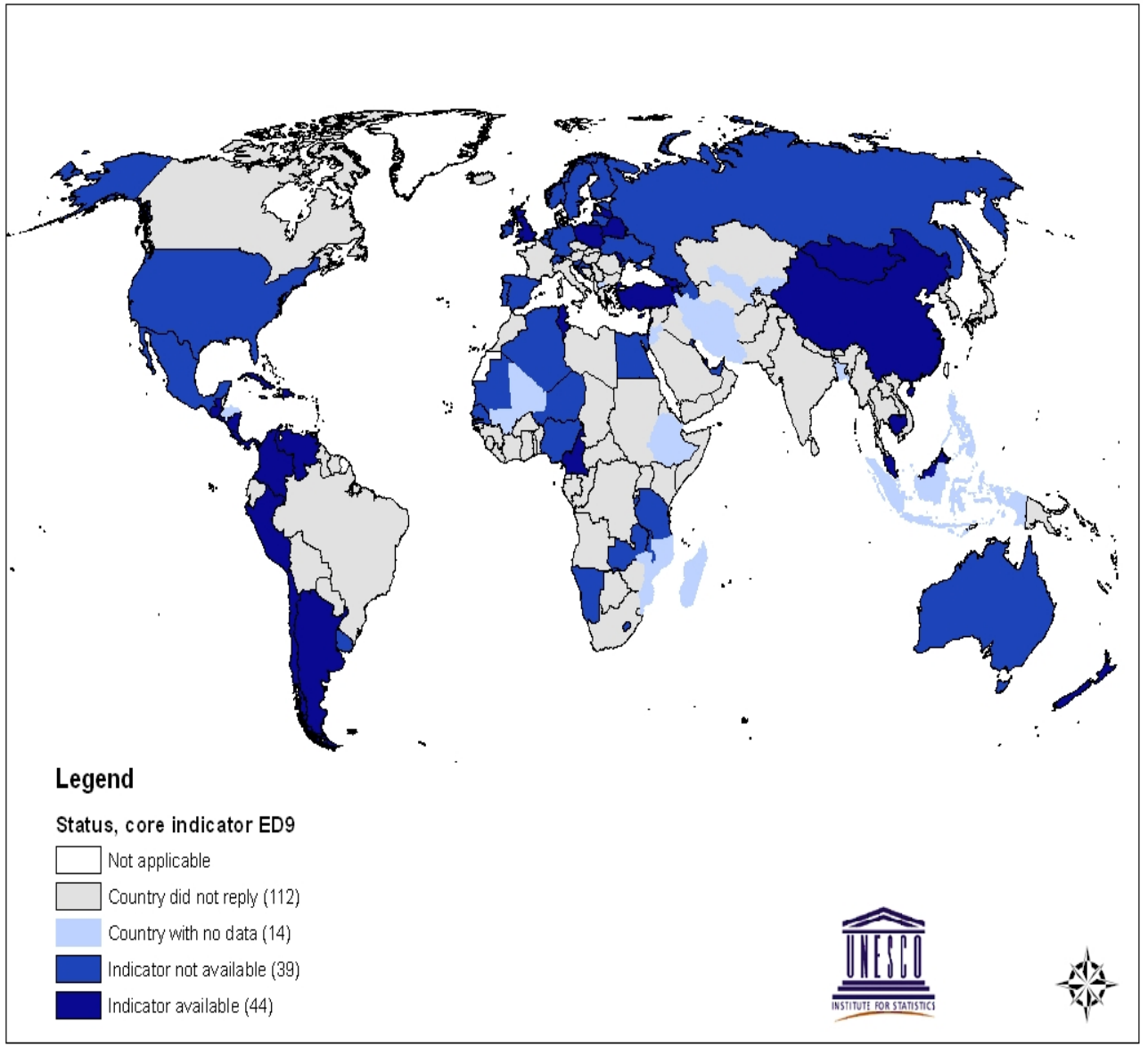
Overview on the core indicator measurement: ED8 (% student in ICT related fields)

- **Definition:** Number of students currently admitted in ICT-related fields as a percentage of all students enrolled in educational institutions in a given country for ISCED levels 5 to 6.
- **Purpose:** To measure the share of students in ICT-related fields of study in tertiary education institutions.
- **Data requirement:**
  - Total number of students by gender enrolled in ICT-related fields in tertiary education institutions in a given country at ISCED levels 5 to 6.
  - Total number of students by gender enrolled in tertiary education institutions regardless of their fields of study in a given country for ISCED levels 5 to 6.
- **Remarks:** New classification is required to establish standardized equivalence of fields of studies that should be considered ICT-related.



Overview on the core indicator measurement: ED9 (% of ICT-qualified teachers)

- **Definition: Number of primary and secondary teachers who have received ICT training, expressed as a percentage of the total number of teachers at these levels of education.**
- **Purpose: To measure the extent to which primary and secondary school teachers are trained in ICT.**
- **Data requirement:**
  - **Total number of teachers in primary and secondary schools regardless of subject(s) taught.**
  - **Total number of teachers who have received ICT training in primary and secondary schools.**
- **Remarks: ICT qualification is judged only on the basis of national norms and there are difficulties at global level to ensure that the teachers training content and the national standard are comparable. (Option: ICDL?)**



Current limitations

- Need to refine definitions and classifications after pilot-testing the current ones
- Need to improve policy relevance of the core list by its future expansion to measuring:
  - Intensity of use of the ICTs by learners and teachers for educational purposes
  - Progress in ICT skills formation
  - ICTs impact on educational achievements and outcomes in labour market etc.

Key lessons from the scoping survey

- Lack of standardized definitions, classification, methodological and operational manuals, or indicator guidelines;
- Many national statistical systems, especially in the developing world, lack readily available and comparable data on ICTs in education
- ICTs in education is still not that widespread and ICT policies for education are still at an experimental stage in a majority of countries

☞ ***Formation of a technical Working Group on ICT Statistics in Education (WISE) of 20 pilot countries to test, amend, operationalize and validate refined definitions and methodologies***

Indicative agenda for future

Discussion and endorsement of the TOR of the WISE by the Steering Committee of the Partnership	May-08
Commissioning of the development of a conceptual, methodological and operational guidebook for the collection of ICTs statistics in education	June-October 2008
Development of new data collection questionnaire on ICTs in education	Sep-08
Circulation of the draft guidebook and the new questionnaire among the network of WISE experts for initial comments	Nov-08
Electronic consultation with countries in coordination with UN regional commissions to identify pilot countries	September-November 2008
Validation workshop of the guidebook and new questionnaire	Feb-09
Discussion of the guidebook and new questionnaire at the UIS regular education workshops	February-December 2009
Launch of the pilot test of the new questionnaire with WISE countries	May-09
Questionnaire returns	Jul-09
Data processing, drafting of analytical report, preparation of country profiles	July-September 2009
Peer-review workshop for the analytical report and amendment/validation of the revised questionnaire	Oct-09
Rollout of the revised questionnaire on ICTs in education to all UNESCO Member States	Jan-10

THANK YOU

Compatibility of core indicators with regional imperatives

Core indicators	ECA	ESCWA	ECLAC
ED1 Percentage of schools with electricity (by ISCED level 1 to 3)			☑
ED2 Percentage of schools with radio set used for educational purposes (by ISCED level 0 to 4)			☑
ED3 Percentage of schools with television set used for educational purposes (by ISCED level 0 to 4)			☑
ED4 Student to computer ratio (by ISCED level 0 to 4)	☑	☑	☑
ED5 Percentage of schools with basic telecommunication infrastructure or telephone access (by ISCED level 1 to 3)			☑
ED6 Percentage of schools with an Internet connection (by ISCED level 1 to 3)	☑	☑	☑
ED7 Percentage of students who use the Internet at school (by ISCED level 0 to 4)	☑	☑	☑
ED8 Percentage of students enrolled by gender at the tertiary level in ICT-related fields (ISCED level 5 to 6)	☑	☑	☑
ED9 Percentage of ICT-qualified teachers in primary and secondary schools (of the total number of teachers)	☑	☑	☑

Computability of core indicators in international schools surveys

SURVEY	Number of participating countries or territories	ED1	ED2	ED3	ED4	ED5	ED6	ED7	ED8	ED9	TOTAL
Latin American Laboratory for the Assessment of Quality in Education (LABORATORIO 1997)	12			☑	☑	☑				☑	4
Monitoring Learning Achievement (MLA 1992-2003)	72	☑			☑		☑	☑			4
Programme d'Analyse des Systèmes Educatifs des pays de la CONFEMEN (PASEC 1993-1998)	23	☑									1
Programme for International Student Assessment (PISA 2003)	41				☑		☑	☑		☑	4
Progress in International Reading Literacy Study (PIRLS 2001)	35			☑	☑		☑	☑			4
Second Information Technology in Education Study (SITES-M1 1997-1999, SITES-M2 1999-2002, SITES-M3 2006)	21				☑		☑	☑		☑	4
Southern and East Africa Consortium for Monitoring Educational Quality (SACMEQ 2000-2003)	15	☑	☑	☑	☑	☑					5
Trends in International Mathematics and Science Study (TIMSS 2003)	51				☑		☑	☑		☑	4
World Education Indicators – Survey of Primary Schools (WEI-SPS 2004)	13	☑	☑	☑	☑	☑	☑	☑		☑	8
UNESCO Bangkok: Asia-Pacific Regional Survey (UAPRS 2004)	9	☑	☑	☑	☑	☑	☑	☑		☑	8
Literacy Assessment and Monitoring Programme (LAMP)	6		☑	☑	☑		☑				4
TOTAL		5	4	6	10	4	8	7	0	6	