

Improving statistical literacy – best practices and challenges

Instructions: Click on the link to access each author's presentation.

Organiser and discussant: [Reija Helenius](#)

Chair: Dominik Rozkrut

Participants:

[Hugo Hernández:](#) How the ISLP Poster Competition helps to improve statistical literacy?

[Bianca Walsh:](#) Strategies to increase the reach of statistical literacy initiatives at the Brazilian NSI (IBGE)

[Elisa Falck:](#) Promoting statistical literacy: opportunities and challenges

[Graciela Marquez:](#) Cuéntame de México”, a microsite designed for children and young students with statistics and geographical data of Mexico



How the ISLP Poster Competition helps to improve statistical literacy?



IAOS-ISI 2024, Mexico City
May 16th, 2024

Hugo Hernández Trevethan
UNAM



The International Statistical Literacy Project

The International Statistical Literacy Project has its origin on the mid nineties of the 20th Century, but it was until 2007 that came up the idea of a competition with high school and junior high students, having its first edition at international level in 2008-2009.



The poster competition

Then, the competition became a poster competition in 2010 and has been running since then in that format, and with the support of the country coordinators in each participating country. Mexico has been in all the competitions since 2008.



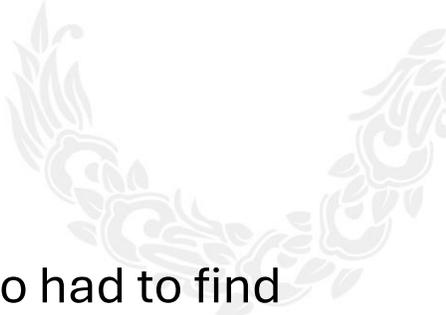
While participating in the Poster Competition, the students can understand that statistics have a meaning within a context, being this the need of data-based studies to prevent or to solve a problem of almost any nature. They are expected to be able to understand the underlying ideas on data collection and its limitations, the possible reason for biased results, which are the better tools for describing a set of data, how far the conclusions may go. And all this potential formation in statistics literacy may be expanded to the students' tutors and to those who may read their posters.

Mexico and some challenges

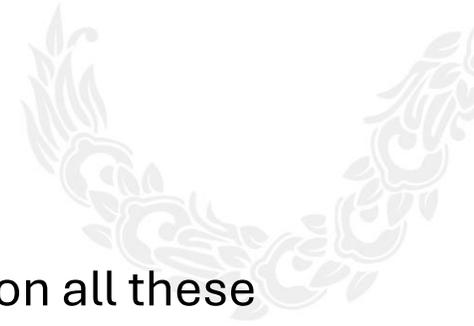
Besides the administrative and operative challenges, one of the biggest issues was precisely the lack of statistical formation and statistical literacy among not just our participants, but as well among the teachers guiding them.



As an example, it was a widespread idea that in order to carry out a statistical project the first thing to have are data instead of a research question, which usually came after collecting the data and after all the descriptive process... And, again, this is just an example.



So, the country coordinators in Mexico had to find our way not just to organize the national phase of the competition, but also to improve the statistical formation and literacy.



What has been done?

For the organization of the competition all these years we've counted on the support of the National Autonomous University of México (UNAM). And this support has been the path to try improving statistical integral formation from different directions.



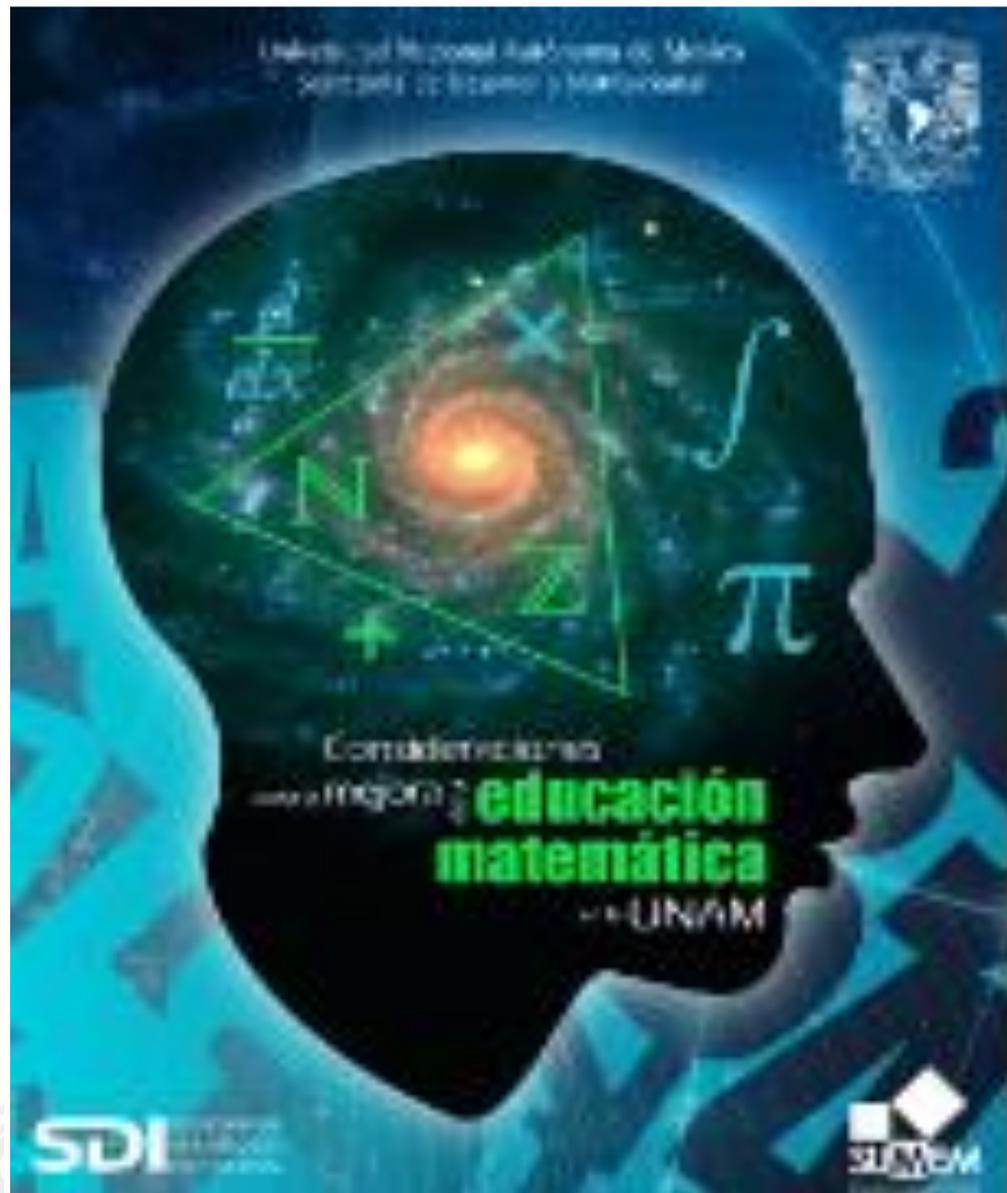
One route of action was not just inviting the students to participate in the competition but also offering them and their teachers as well a quick course on Statistics, statistics literacy, the use of some software -TinkerPlots, Fathom or JMP- and a glance to what the ISLP is, reviewing the posters of former competitions in the site with the proper discussions.



This courses, offered for almost every edition of the ISLP Poster Competition each two years and more than once at different UNAM's campus at one time, has been a chance to improve statistical knowledge and literacy among students and teachers.



A second path was through one working group within the UNAM known as SUMEM, which at some point proposed standards on Mathematics for the three high school systems held by the UNAM. The standards proposed specifically for statistics included statistics literacy; these ideas later led to some scholar syllabus to introduce statistical literacy in their Statistics contents.





And another way has been an encounter held every two years, some weeks before the international competition, among the national winners of the Latin American countries participating, in which the national winners and their teachers briefly present and explain their posters.

And now...

At the present day, Mexico has five country coordinators, three of them in Mexico City and two more in Merida, Yucatan, which is allowing us a wider coverage to promote and conduct not only the poster competition of the ISLP, but some other actions to improve statistical literacy, but supporting and sponsorships are yet a huge challenge.



Thank you





How to increase the reach of statistical literacy initiatives?

Bianca Walsh

National School of Statistical Sciences IBGE



Initiatives at IBGE



IBGExplica



IOS-ISI 2024
MEXICO CONFERENCE

IBGE Explica



PIB

PIB: o que é, para que serve e como é calculado • IBGE Explica



Taxa de Fecundidade

Fecundidade no Brasil • IBGE Explica



IPCA / INPC

O que é inflação • IBGE Explica IPCA e INPC



POF

Quanto o brasileiro gasta e com o quê • IBGE Explica



Como saber os dados mais atuais da economia brasileira?

Info... Assistir m... Compartilh...

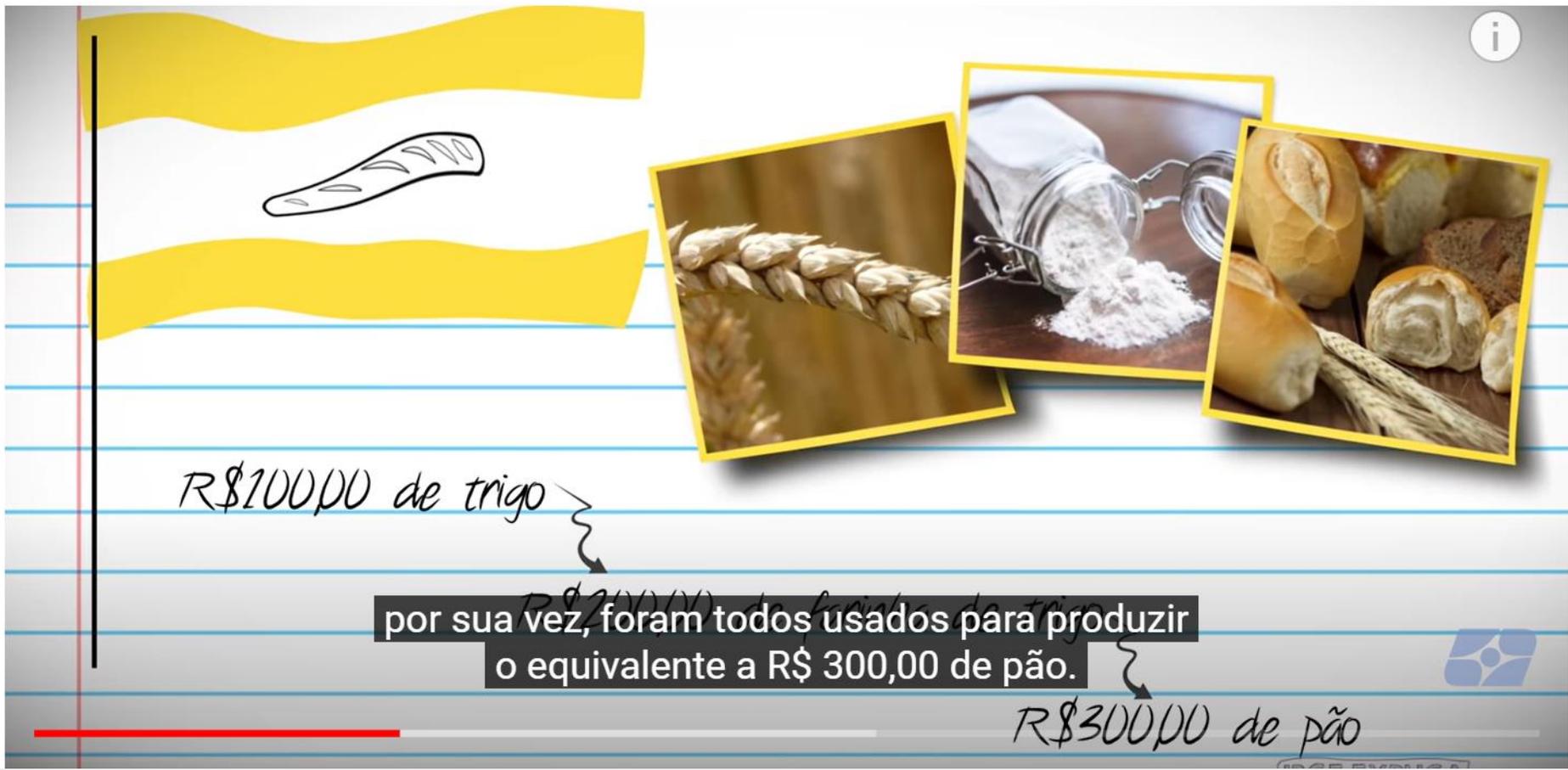


Pesquisas
Economicas do IBGE

Pausa (k)

0:28 / 6:55 • Introdução

YouTube HD



IBGEduca



IOS-ISI 2024
MEXICO CONFERENCE



O IBGEeduca é o portal do IBGE voltado para a educação: com conteúdos atualizados e lúdicos sobre o Brasil.



crianças

Quer descobrir o Brasil? Informações, brincadeiras, mapas e material para pesquisa. Para você aprender brincando!



jovens

Informações sobre o País e a população, numa linguagem simples e direta. Para estudar, conhecer e participar!



professores

Atividades e recursos para suas aulas, com informações sobre o Brasil e suas várias realidades.





Brasil

Mapas

Mural

Brincadeiras



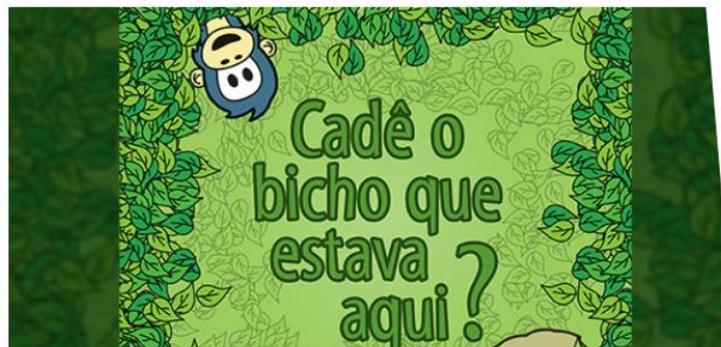
CLUBE DOS CURIOSOS



QUEBRA-CABEÇAS DE MAPAS



CADÊ O BICHO QUE ESTAVA AQUI?



JOGO DA MEMÓRIA FAUNA EM EXTINÇÃO



Apresentação

Aqui você encontra sugestões de atividades pedagógicas para trabalhar com as informações produzidas pelo IBGE. Você também conta com recursos para utilizar nas aulas: são vídeos, mapas, gráficos, jogos e materiais explicativos. E compartilhe suas experiências com conteúdos produzidos pelo IBGE enviando relatos para o Blog do Professor.



Sugestões de atividades [ver mais](#)

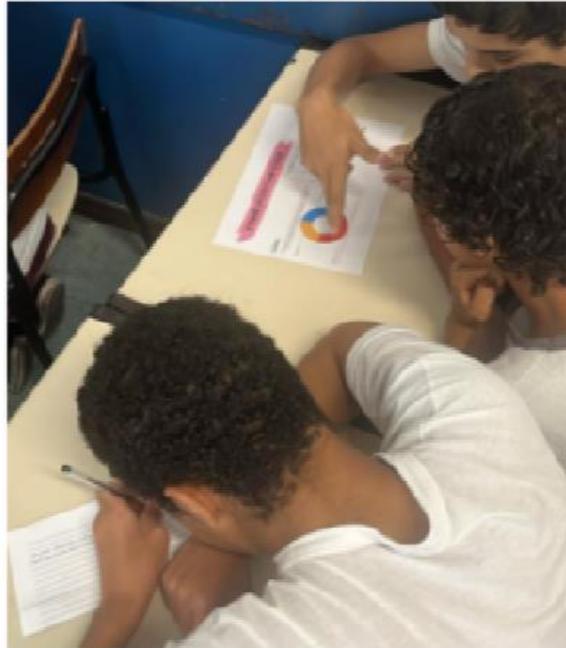
Census in schools



School children presenting the results of their Census at ENCE



ENCE graduation students facilitating activities about graphics in the public school



Overcoming limitations



IBGExplica

- Lack of people or time to develop new videos.
- Census results were expected to have a dedicated series

Strategy:

- Use of social media posts after the release of each result



Metrics on the posts with the results of Census 2022

Post	Tipo	Contas Alcançadas - Instagram	Interações - Instagram	Data da coleta das métricas
Primeiros Resultados Censo 2022 - post 01 (endereços)	Vídeo	31.800	1.903	13/07/2023
Primeiros Resultados Censo 2022 - post 02 (população)	Carrossel	16.800	1.547	13/07/2023
Primeiros Resultados Censo 2022 - post 03 (regiões)	Carrossel	24.700	2.549	20/07/2023
Primeiros Resultados Censo 2022 - post 04 (concentração/densidade)	Carrossel	15.600	1.135	20/07/2023
Primeiros Resultados Censo 2022 - post 05 (municípios)	Carrossel	21.200	1.863	27/07/2023
Primeiros Resultados Censo 2022 - post 06 (domicílios)	Carrossel	15.900	1.079	03/08/2023
Quilombolas - Primeiros Resultados	Carrossel	9.043	701	17/08/2023
Indígenas - Primeiros Resultados	Carrossel	9.463	1.059	24/08/2023
Sexo e idade - post 01 (animação pirâmide etária)	Vídeo	29.300	1.485	14/12/2023
Sexo e idade - post 02 (proporção de homens e mulheres)	Carrossel	19.500	1.989	21/12/2023
Sexo e idade - post 03 (população mais jovem e mais envelhecida)	Carrossel	20.000	1.766	28/12/2023
Cor ou raça - post 01 (dados do país)	Carrossel	50.296	10.167	19/04/2024
Cor ou raça - post 02 (dados por região)	Carrossel	21.326	3.047	19/04/2024
Cor ou raça - post 03 (dados por UF)	Carrossel	10.359	1.344	19/04/2024
Coordenadas e tipos de endereços	Carrossel	22.562	3.265	19/04/2024
Características dos domicílios - post 01 (casas e apartamentos)	Carrossel	19.342	2.465	19/04/2024
Características dos domicílios - post 02 (abastecimento de água)	Carrossel	11.502	1.072	30/04/2024
Características dos domicílios - post 03 (esgotamento sanitário)	Carrossel	9.887	1.042	02/05/2024

Source: Instagram Analytics

Most impactful carousel post

ibgeoficial • Seguindo

Vem conhecer
**OS PRIMEIROS
RESULTADOS
DO CENSO 2022**
sobre identificação
étnico-racial da
nossa população



Curtido por ivonebatista10 e outras pessoas

ibgeoficial • Em relação a 2010, a população preta aumentou 42,3% e sua proporção no total da população

Usar o app

ibgeoficial • Seguindo

Os dados do **Censo Demográfico 2022** evidenciam que a população residente no Brasil* é formada por pessoas:

	92.083.286 pardas 45,3%
	88.252.121 brancas 43,5%
	20.656.458 pretas 10,2%
	1.694.836 indígenas 0,8%
	850.130 amarelas 0,4%

* Desconsideradas as pessoas que não responderam ao quesito cor ou raça, e consideradas como indígenas as pessoas que se declararam assim no quesito cor ou raça e no quesito se considera indígena



Curtido por ivonebatista10 e outras pessoas

ibgeoficial • Em relação a 2010, a população preta aumentou 42,3% e sua proporção no total da população

Usar o app

ibgeoficial • Seguindo

Distribuição percentual da população residente (%)
Segundo a cor ou raça - Brasil - 1991/2022



Ano	Pardas	Brancas	Pretas	Indígenas	Amarelas
1991	42,5	51,6	5,0	0,2	0,4
2000	38,5	53,7	6,2	0,1	0,5
2010	43,1	41,7	10,2	0,4	1,1
2022	43,1	45,3	15,3	0,6	0,4

Fonte: IBGE, Censo Demográfico 1991/2022



Curtido por ivonebatista10 e outras pessoas

ibgeoficial • Em relação a 2010, a população preta aumentou 42,3% e sua proporção no total da população

Usar o app

A video post with age pyramid animation



<https://www.instagram.com/p/C0zWeCCuEx5/>

IBGEduca

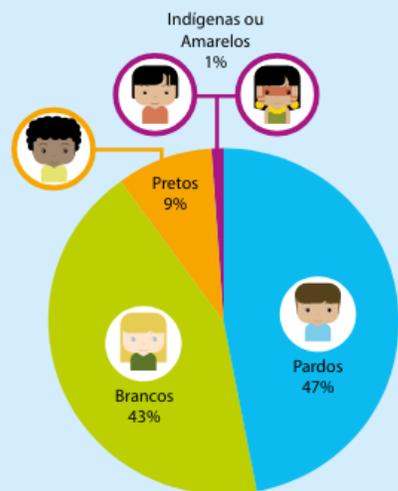
- Lack of access to the internet.
- Vast territory with a variety of infrastructure conditions.

- **Strategy:**
- Conjoining some offline, printed content to reach distant corners of Brazil



Printed folder with activities for teachers

Que tal trabalhar com seus alunos informações sobre o Brasil, sua população e território?



Para encontrar informações sobre o seu município, visite o app Cidades do IBGE!



População estimada para 2020:
211.755.692 pessoas



2010

População no Censo 2010:
190.755.799 pessoas



Densidade Demográfica no Censo 2010:
22,43 hab./km²



PIB per capita em 2018:
R\$ 33.593,82



Salário Médio em 2020:
R\$ 2.391,25*



Taxa de fecundidade com projeção para 2020:
1,76 filho por mulher



Taxa de analfabetismo de 15 anos ou mais anos de idade em 2019:
6,6%



Taxa de escolarização de 6 a 14 anos de idade em 2019:
99,7%



Com 8.510.345,538 km², o Brasil é o quinto maior País do mundo, atrás de Rússia, Canadá, China e Estados Unidos.



Printed folder with activities for teachers

E-book com propostas para professores da Educação Básica

Conheça abaixo uma das ideias propostas pelo IBGEeduca. Você pode encontrar diversos **planos de aula** completos com informações sobre o Brasil no e-book disponível no site do IBGEeduca.



O Censo Demográfico é uma grande pesquisa realizada pelo IBGE para saber quantos somos, como somos e onde vivemos. Conhecer melhor a população é de extrema importância para o Brasil. A operação que envolve o Censo é muito grande, pois os recenseadores têm que pesquisar informações sobre todos os domicílios de todos os municípios brasileiros. Dessa forma, é importante que seus alunos colaborem com essa operação através da conscientização de seus familiares e comunidade. Nesse sentido, é fundamental que seus alunos entendam as etapas de uma pesquisa, para saber como se produzem informações sobre determinada realidade ou grupo social.

Atividade: Fazendo uma Pesquisa na Escola

Observe as etapas abaixo que servem como base para a realização de uma atividade de pesquisa na escola. Aprofunde a proposta de acordo com a etapa e série da Educação Básica na qual leciona.

1. **Elabore, junto com a turma, uma questão para a pesquisa. Por exemplo: quantos meninos e quantas meninas existem na escola?**
2. **Organize sua turma para realizar a coleta de dados. Divida em grupos de acordo com o número de turmas e alunos da escola. Disponibilize formas de registro, como um questionário, por exemplo.**
3. **Classifique os dados que foram coletados.**
4. **Crie, com sua turma, formas de registro e representação dos dados. Sua turma pode produzir cartazes com gráficos, tabelas, infográficos. Ou ainda criar um blog ou página em rede social que disponibilize essas informações.**
5. **Observem os dados registrados e discutam as conclusões da pesquisa.**

Ao final desse processo, seus alunos terão executado as etapas de uma pesquisa para produzir conhecimento sobre a comunidade escolar. Poderão iniciar a compreensão da importância da pesquisa para a produção de dados relevantes sobre determinada realidade.

Census in schools- Extension Project

→ Impossible to go to several schools in presence

Strategy:

→ Creation of a material to aid schools in census application to be distributed through IBGEduca (portal and impressed material)



Testing materials in the school



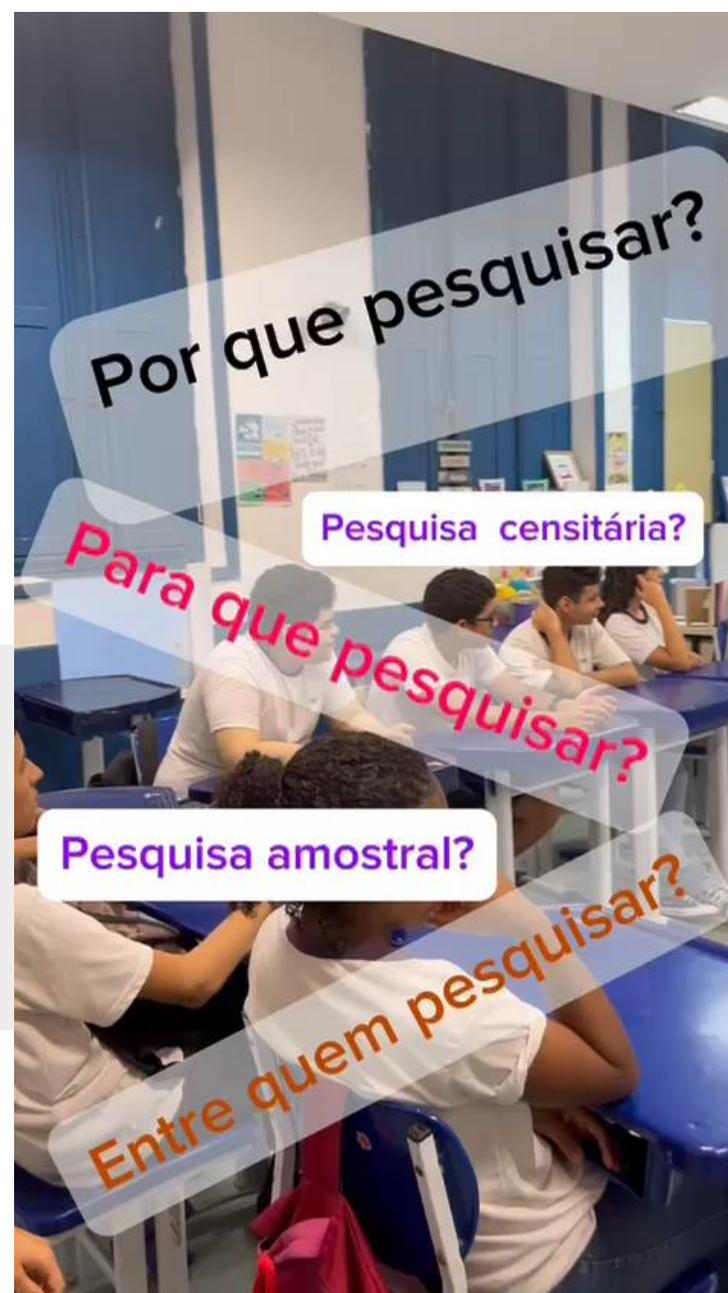
ENÁRPIO:

O PREFEITO DE UMA CIDADE QUER SABER QUAIS OS BAIROS QUE ESTÃO PRECISANDO MAIS DE CRECHES PARA ASSIM SABER ONDE É NECESSÁRIO CONSTRUIR NOVAS CRECHES. ELE RESOLVE FAZER UMA PESQUISA PARA OBTER INFORMAÇÃO.

- 1 - População - alvo?
- 2 - Objetivo da pesquisa?
- 3 - Pesquisa Censitária ou Amostral?
- 4 - Uma hipótese?

Testing materials in the school





Por que pesquisar?

Pesquisa censitária?

Para que pesquisar?

Pesquisa amostral?

Entre quem pesquisar?



Thank you
bianca.walsh@ibge.gov.br





Improving statistical literacy: Best practices and challenges

Elisa Falck
ISLP Project Coordinator



Introduction





Introduction

- Data plays a crucial role in decision-making, and statistical literacy is essential for citizen education
- Considerable efforts are being made everywhere in the world to promote data and statistical literacy
- ISLP has analysed the visibility of statistical literacy across the world
- What kind of initiatives are being carried out to promote this cause?

Concepts and relevance



Defining statistical literacy

- Statistical literacy is:
 - a crucial skill demanded by our information-driven society, enabling individuals to effectively organise, perform, and comprehend diverse surveys and reports.*
 - essential everyday skill, enabling individuals to stay informed about current events and make informed daily decisions.*
- Gould (2017) / statistical and data literacy:
 - comprehending the entities responsible for and the motivations behind data collection, the methodologies employed for data acquisition, and also some proficiency in analysing and deciphering data obtained from both random and non-random samples.*

Key actors in the field



Key actors in the field

- The International Statistical Literacy Project (ISLP) is aware of the need to promote statistical literacy in all domains and stages of life.
- Initiatives to promote statistical literacy rely essentially on teachers, students, educational communities (f.ex. universities), international organisations (f. ex. ISI), NSOs, governments, media, private companies, societies (f. ex. statistical societies) and other partners that contribute to capacity building for statistics education.

Scoping review 2024

Source: Falck, Campos, D'Amelio,
Helenius 2024, unpublished
article

The purpose of the scoping review of 206 NSO sites in
the world was to

i. Outline:

- a. Whether the sites mentions statistical education
and/or statistical literacy;
- b. Whether the site has materials and resources for
statistical education and/or statistical literacy.

ii. Extract:

- a. Examples of good practices from the field of
statistical education and/or statistical literacy.

Statistical literacy in the NSOs



Statistical literacy in the NSOs

Competitions

Workshops, seminars, webinars, school visits

NSO statistical learning materials

Partnering with universities and other co-operation partners and organizing educational programmes and courses in co-operation

Source: Falck, Campos, D'Amelio, Helenius 2024, unpublished article

NSO's statistical literacy online resources

- Target audiences were:
 - Young people
 - Teachers
 - Adults
- Some countries mentioned statistical literacy in their website but did not include materials
- The following sites were designed for children and young people and stood out in particular: Singapore, Argentina, Brazil, and Colombia



Census Academy

United States[®]
Census
Bureau



Challenges

Lack of resources: funds, human resources, know-how

Technology (software and skills)

Statistics and statistical literacy not represented in the curriculum

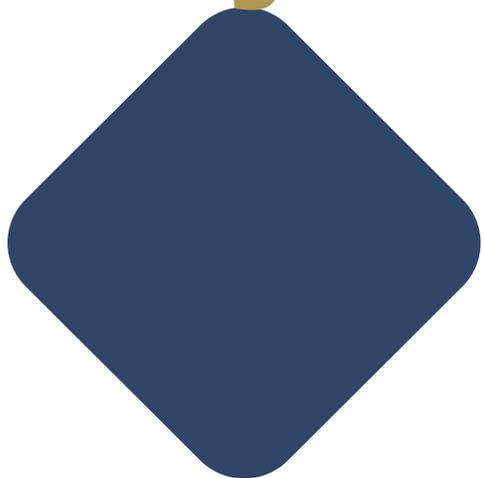
Low interest of policy-makers and society

Lack of interest in statistics affects teachers and students

Influence of the pandemic

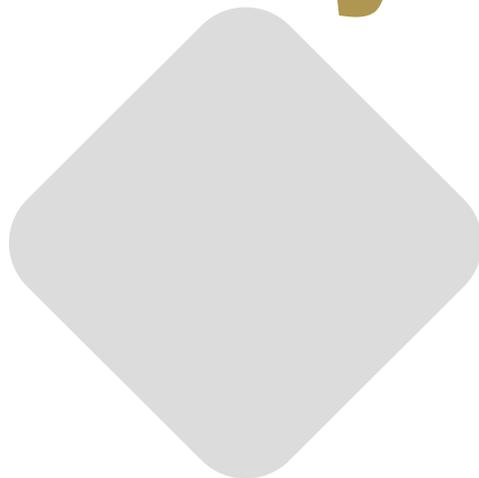
Source: Falck, Campos, D'Amelio, Helenius 2024, unpublished article

Key takeaways



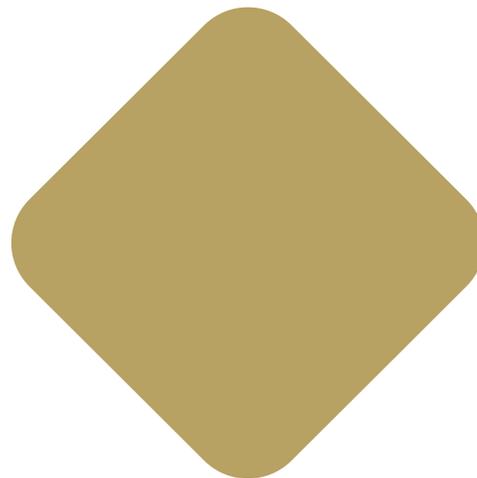
TARGETING YOUTH

Youth are the most common target group for statistical literacy learning materials, along with teachers.



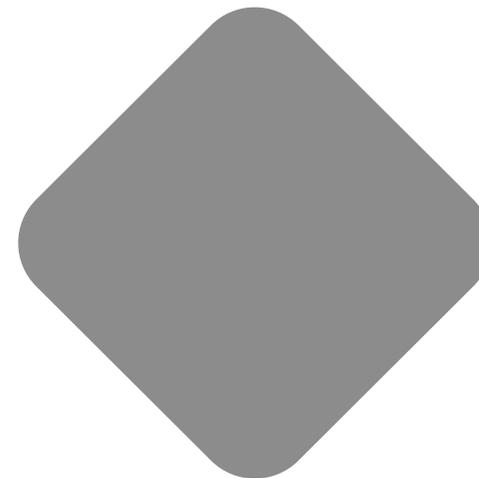
...AND ALL AGES

In addition to children and youth, the statistical literacy of all citizens can be improved via different activities, social media posts and educational videos. Data analysis skills can also be facilitated in many ways



ACTIVITIES

Same message displayed from different angles ensures maximum reach.



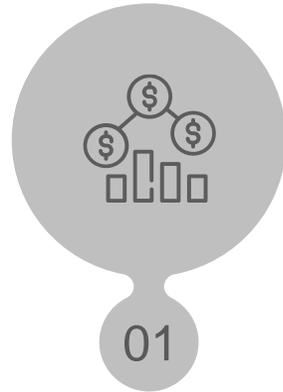
CREATING ECOSYSTEMS

Co-operating with other parties reduces workload and creates support structures.
Co-operation can happen with:
Statistical societies, universities, projects and other key actors



Conclusions

There is great potential for NSOs to learn from each other's practices.



NSO can share the workload with other actors

Statistically literate individuals and societies

Best practices can be disseminated worldwide through international co-operation projects, such as the ISLP and UNITAR/GIST

Wider reach, statistical literacy gaining more traction in societies

Thank you



**Reach out:
Elisa Falck, islp.coordination@gmail.com**



Data literacy: INEGI's experience and challenges

Graciela Márquez
President at INEGI



Content

Reaching out future users of information

- *Cartography for Mexico and the world*, for elementary school.
- *Cuéntame de México*: a dedicated section for children in INEGI's website.

Young data users

- Explaining the SDG's
- *Cátedra INEGI*: outreach & dialogue with Mexico's universities

Thematic courses

- Journalists.
- Public officials.
- Business organizations and chambers of commerce.
- Diploma on Economic Indicators (with Mexico's Central Bank).

Challenges and the road ahead





Reaching out future users of information



Cartography of Mexico and the world



A close collaboration between INEGI and the Ministry of Education.

Since 2008 , INEGI designs the contents of the *Geographical Atlas of Mexico* for the 3rd grade in elementary school. Since 2023 it's called *Cartography of Mexico and the world*.

The *Cartography of Mexico and the world* is part of the syllabus in public and private schools throughout the country.

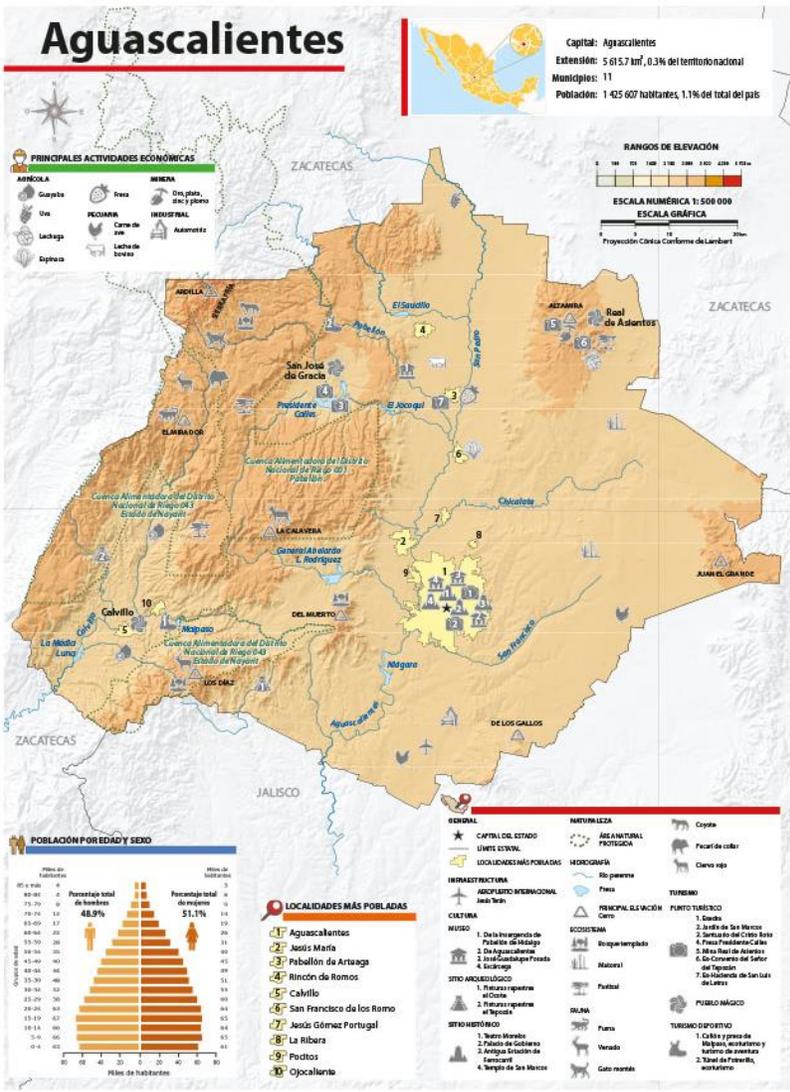


Reaching out future users
of information

Young data users

Thematic courses

Cartography of Mexico and the world



It is distributed nationally among 4th, 5th, and 6th grade students and teachers in both public and private primary schools, amounting to approximately 2.5 million copies per school year.

It is used across different subjects: geography, history, and civic education, natural sciences and mathematics.

It has introduced generations of young students to cartography, opening minds to the spatial dimension of knowledge.



Reaching out future users of information

Young data users

Thematic courses

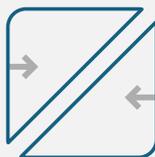
Cuéntame de México



Dedicated section for children in INEGI's website (<https://cuentame.inegi.org.mx/>).



Since 2008: visited by more than 70 million users.



In 2023: 6.7 million users, 13.7 sessions per user, 18.1 million page visits.



Reaching out future users
of information

Young data users

Thematic courses

Cuéntame de México

Cuéntame is designed as a tool for data literacy and establishes a learning path towards citizen use of information by:



Teaching how to interpret and use information critically and responsibly



Developing skills to analyze and evaluate online information.



Promoting an informed and participatory community that relies on quality and verified data for decision-making.



Reaching out future users of information

Young data users

Thematic courses

Cuéntame de México

Cuéntame de México
Sección educativa

Inicio **Descubre** **Explora**

¡Conociendo México!
¿Sabías que solo la mitad del territorio mexicano es tierra firme? ¡El resto son hermosos océanos y mares!

¡Conoce más datos sobre tu país!

Aprende y juega



Reaching out future users of information

Young data users

Thematic courses



Young data users

Explaining the SDG

A work in progress. Our collaboration with UNESCO aims at highlighting the relevance of SDGs for high-school students.

**Electronic
books
(17 essays)**



Conceptual framework.



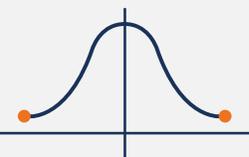
Statistical information supporting the monitoring of the SDGs indicators.



Activities to foster collective and individual learning of statistical competencies, as well as empowering.



INEGI's lecture



In-depth, interactive seminars (16 sessions each) on selected topics. By INEGI experts, on key statistical & geographic data projects.



Hosted by **public and private universities** across Mexico – to disseminate our work, and foster dialogue, feedback & user engagement.



First bi-national edition in November 2023. With Center for U.S.-Mexico Studies, at the University of California - San Diego.

Hallmark of INEGI's outreach & engagement strategy



Since 2015:
36 Seminars
19 states (Mx)
1 bi-national (US-Mx)



Reaching out future users of information

Young data users

Thematic courses



Thematic courses



Thematic courses

Understanding data

Short courses (usually in one or two sessions).

Methodological changes, emerging topics, large volume of information.

Examples:
Change of year base in 2023
Results of the 2022 Agricultural Census.

Diploma on economic indicators

In collaboration with Mexico's Central Bank, specialists in economic indicators from INEGI participate in a year long specialization.

The students are mainly professionals from economics and finance from both private sector and government offices.

Courses on demand

Business organizations, chambers of commerce and other actors' requests courses on specific topics.

Examples of Training:
Mexico's digital map for legislative adviser; SCINCE for government officials; censuses and surveys for members of the business chambers.



Reaching out future users of information

Young data users

Thematic courses



Challenges and the road ahead



Challenges and the road ahead



While Mexican **citizens trust INEGI**, and the information it produces, this information is seldom used for decision making.



We need to reach **more potential users** who, as informants, share their data.



INEGI's museum project



Museo de Estadística y Geografía, a project on an interactive museum for the general public. We need to secure funding for the second and third phases.





Thank you!



IAOS-ISI 2024
MEXICO CONFERENCE

Discussant's speech

Reija Helenius



Three mottos

The ability to critically evaluate and analyse a statistical information is an essential civic and working life skill

The statistician's responsibility is to help others understand statistics

Information, as well as statistics, are only useful when they have been used

The ability to critically evaluate and analyse a statistical information is an essential civic and working life skill





Our aim: a statistically literate person who understands

- how to use statistics in everyday situations, work duties and decision making.

She/he knows

- central statistical concepts and definitions.
- how statistics are
 - made and data collected
 - summarised and tabulated
 - illustrated.
- how to interpret statistical data and graphs.
- how to find, use and evaluate reliable statistical data.



The youth are the future's decision-makers, informants and informed citizens.

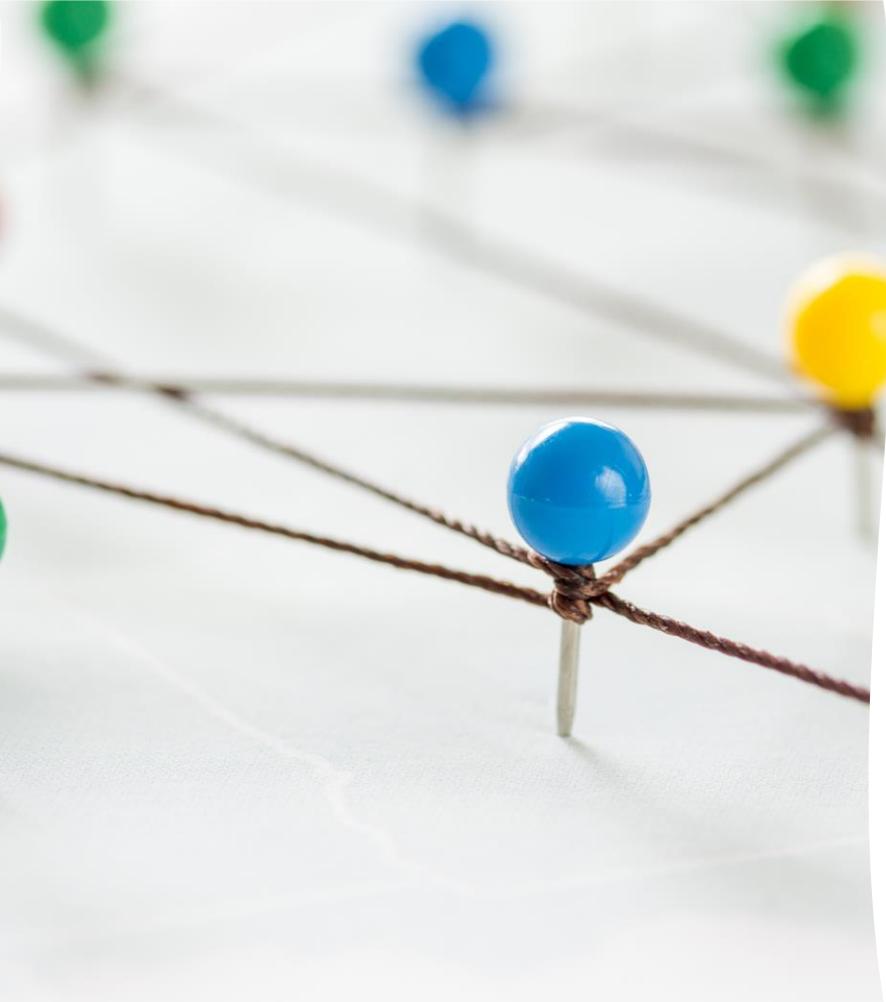
When the young people learn to critically evaluate information and statistics, they'll learn to manage complex information flows also in the future.



We need to respond the things that young people value in communication of statistics

- Inspiring content
- Timely information
- Easily served
- Trivia and insights
- Facts related to everyday life
- Fun
- Visuality





How to put ourselves in the shoes of a user of statistics?

- Can we challenge our own communication methods when we talk about statistics?
- Do we use official language and statistical jargon too much?
- Do we know real needs of users and their communication channels?



**The statistician's
responsibility is to help others
understand statistics**





We all have an important role as

- Information producers
- Information providers
- Trainers and researchers
- Communicators

to improve statistical literacy.

Are we co-operating enough?

- Collaborating with statistical professionals
- Networking with other actors in society
 - Media
 - Educational institutions
 - Libraries
- Using and sharing best practises and innovations
 - No need to reinvent the wheel!



**Information, as well as
statistics, are only useful
when they have been used**





Age of digital natives

- Technology defines our culture more than before
- Accessing information is easier than ever; using it requires a new set of skills, tools and mindset
- Information creates more information
- New media encourages all of us an active participation

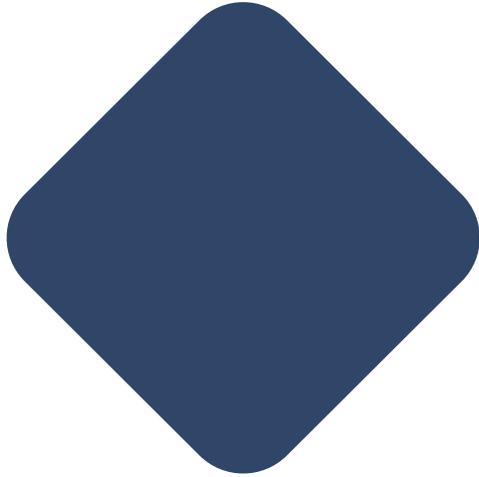


Challenges

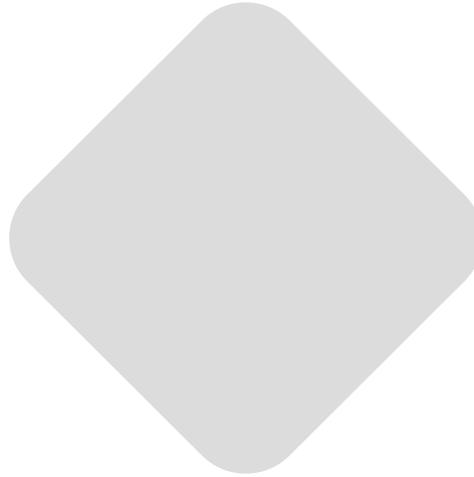
- The whole world is not digital, computerized and connected to the networks
 - Traditional methods, materials and trainings/meetings are also needed
- Resources and competences are limited
- We need to remember also developing countries



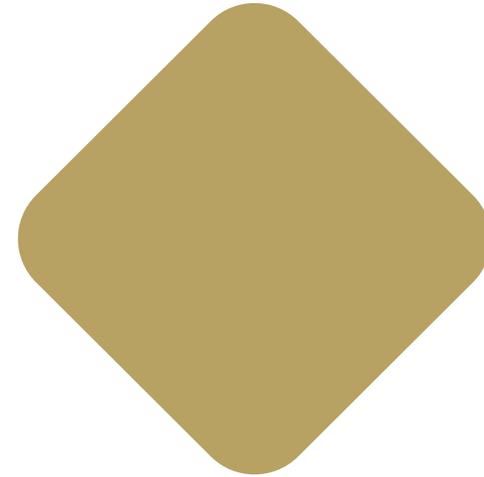
Questions



**Are we co-
operating
enough?**



**How can we
better use each
other's best
practices?**



**Do we really
know the needs
of users?**





International Day of
Statistical Literacy



MAY 21, 2024
8-HOUR CONFERENCE
FREE ONLINE EVENT
10 AM - 6 PM UTC



Register here!





Thank you

