

STEM Gender Equality Congress
Friday 9 June 2017

Stimulating STEM related
skills development and
women's entrepreneurship
through ICT:
Experience from SE Asia

GFF

International Project Planning and Development Division

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Promoting international exchange, international
cooperation, international understanding.

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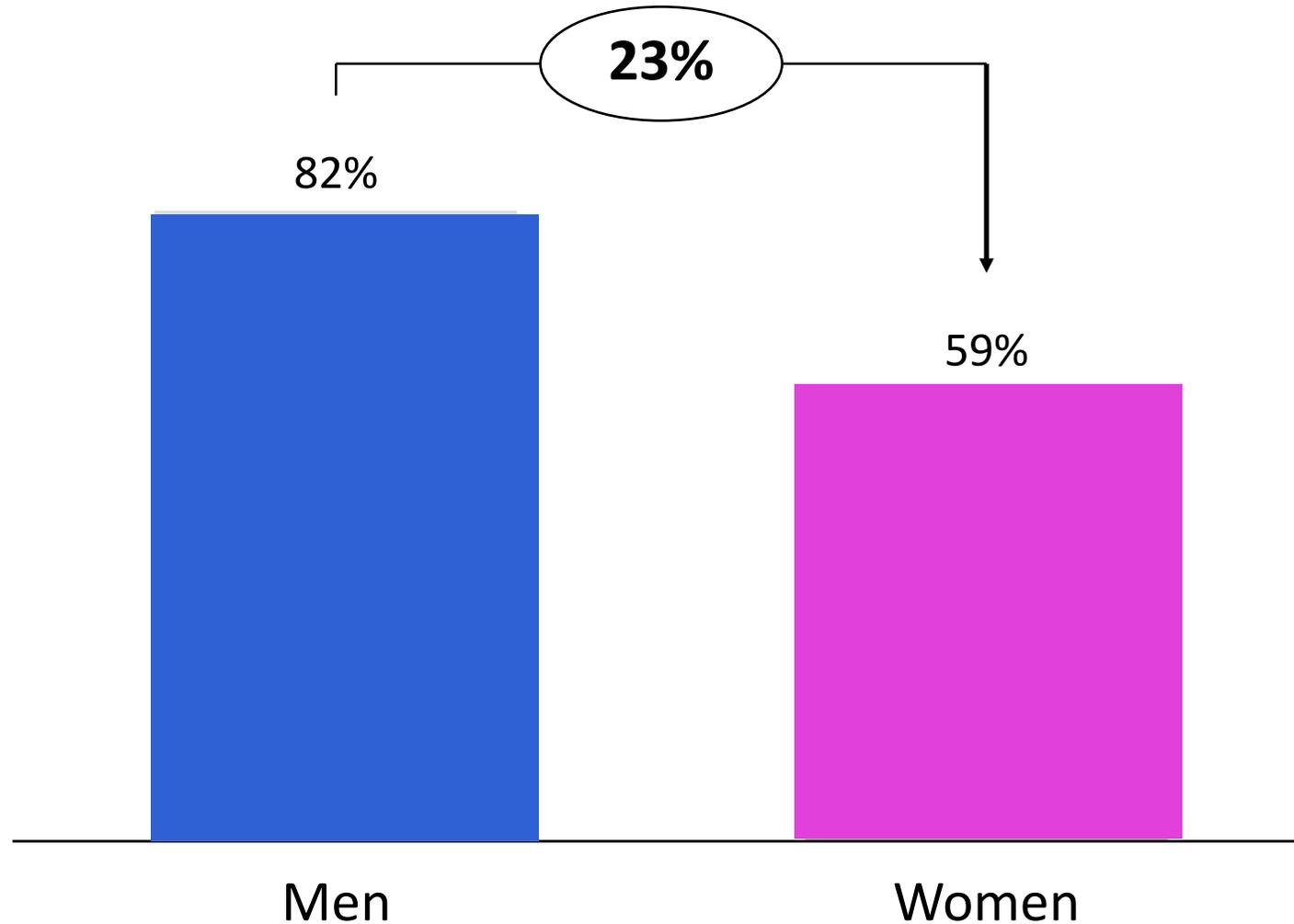
ICT Skills development for Women and Girls in Southeast Asia



 Promoting international exchange, international cooperation, international understanding.
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GFF

The gender gap in the SE Asian workforce is 23% points

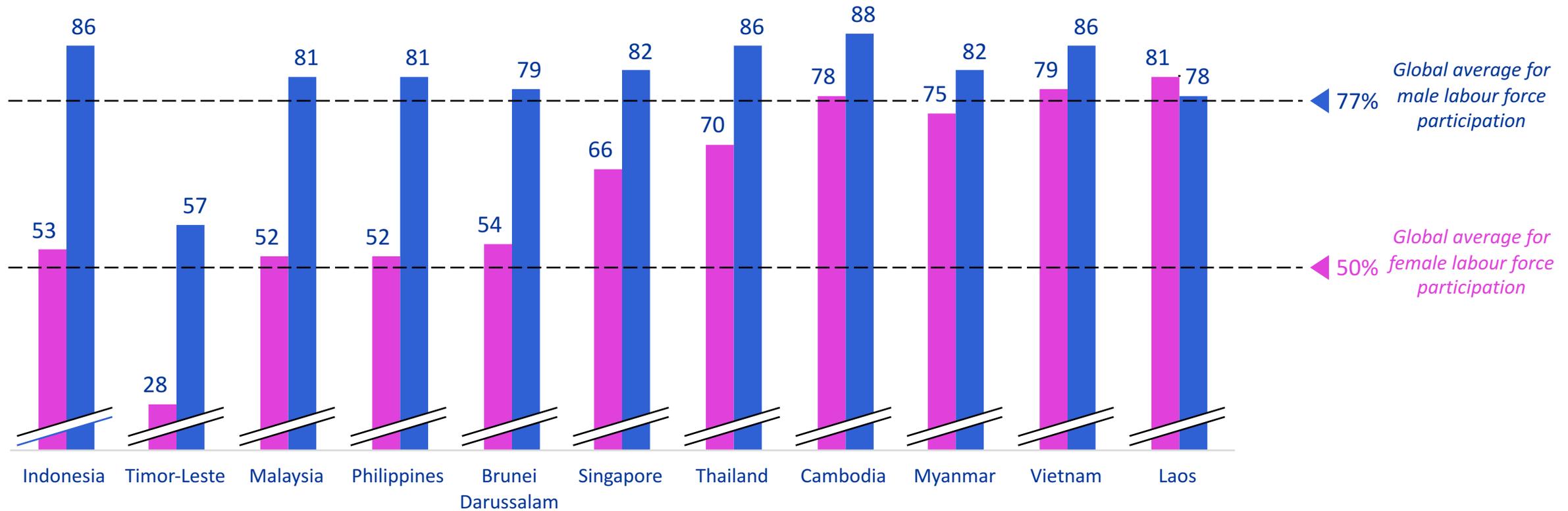


Source: SPF-Dalberg 2017

Female and male labour force participation rates in SE Asia (%)

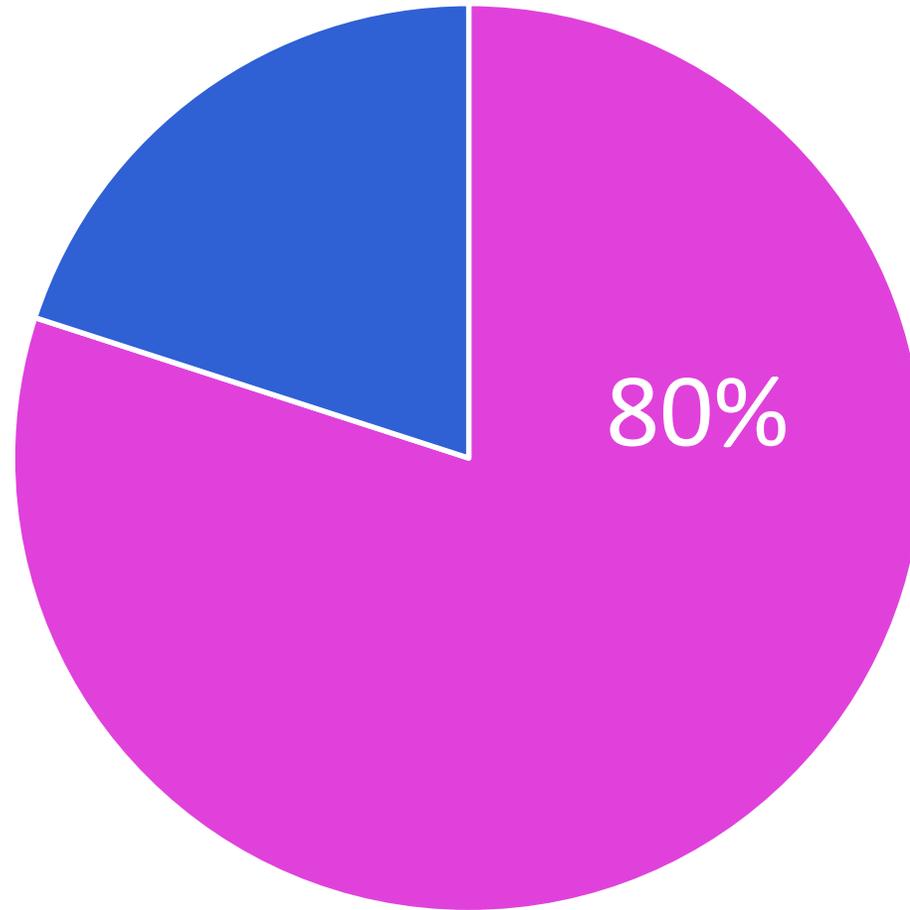


Female Labour Force Participation Rate
Male Labour Force Participation Rate



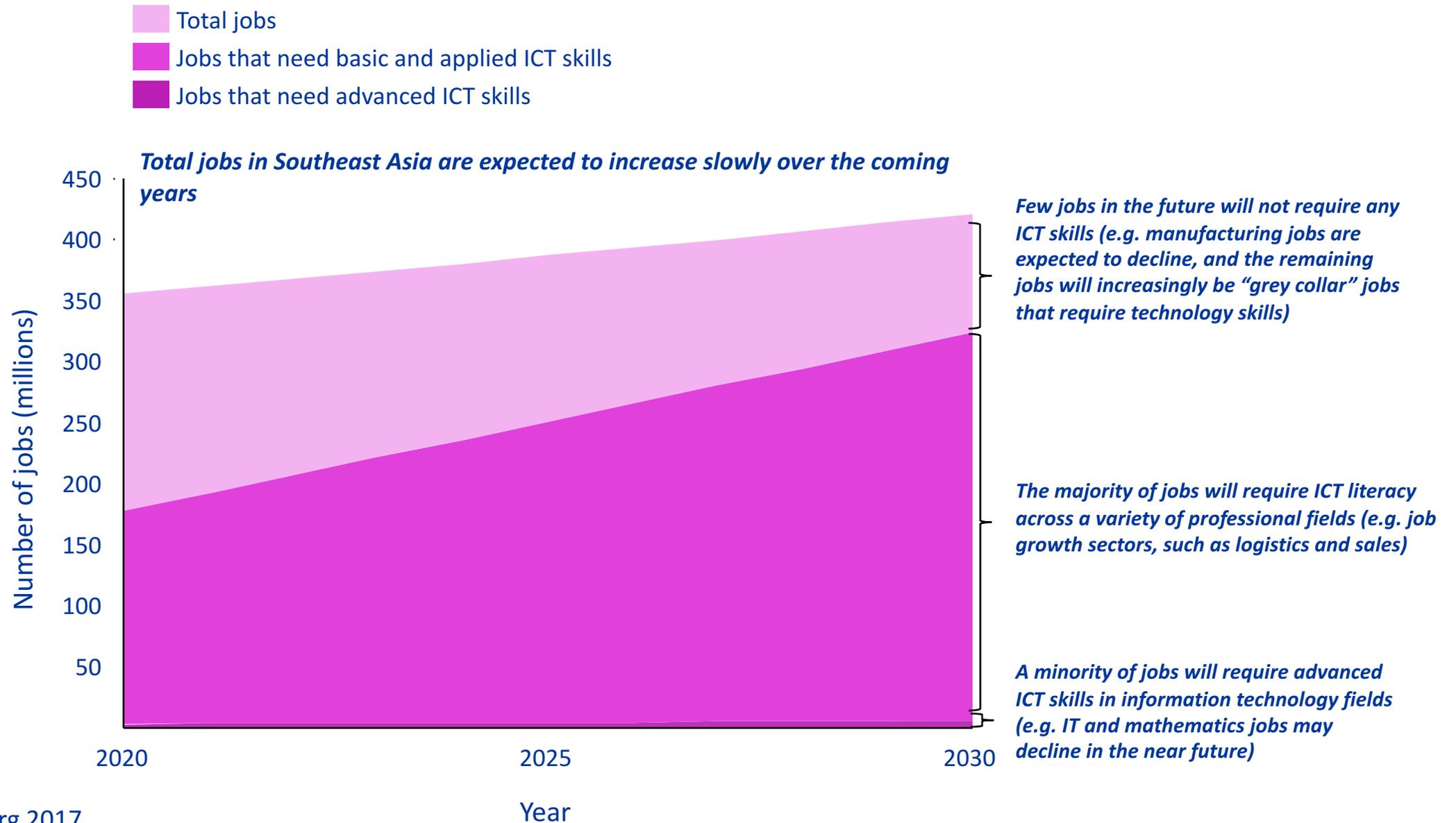
Source: SPF-Dalberg 2017

The majority of future jobs in SE Asia will require ICT skills



By 2030, it is expected that up to 80% jobs in SE Asia will require basic digital literacy and applied ICT skills

The increasing requirement for basic and applied ICT skills in Southeast Asian jobs over the next decade



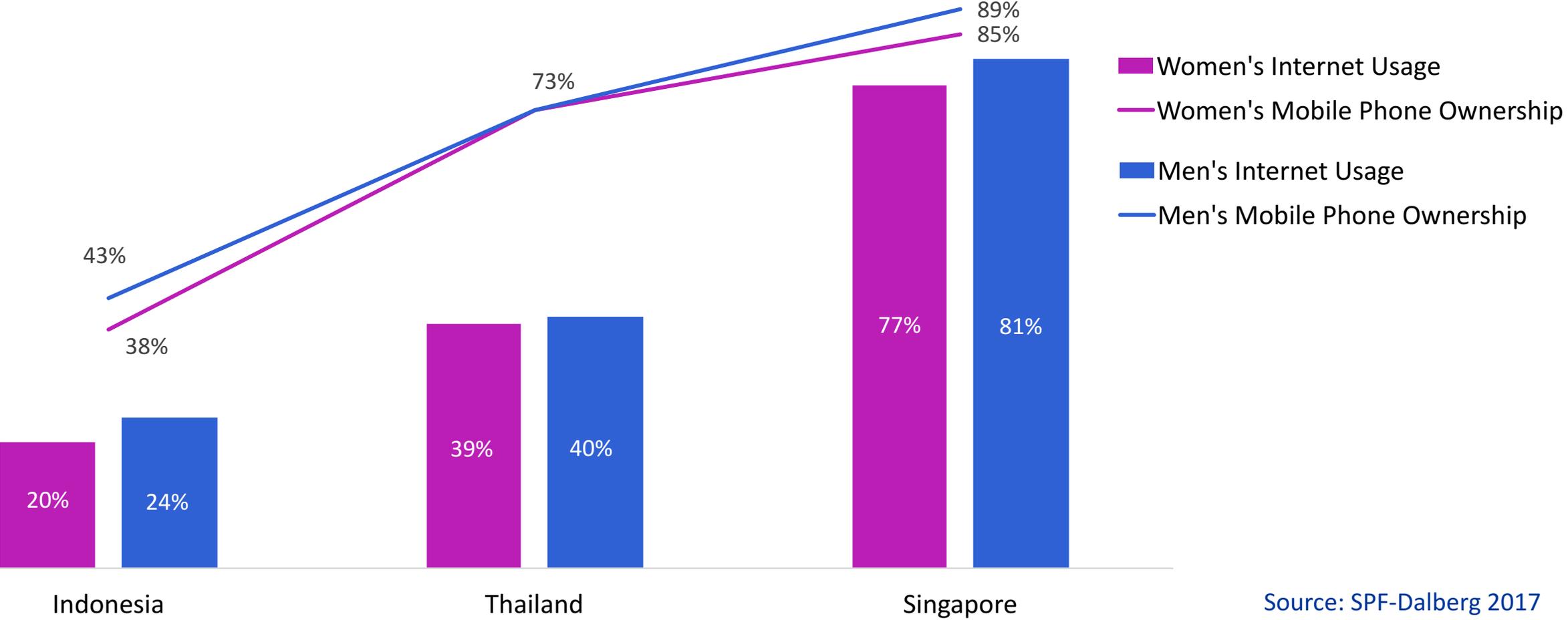
Employment and ICT outlook in ASEAN countries by job group



Growing Employment	Transportation and logistics	12,525	Self-driving cars, mobile ticketing, online booking and tracking
	Sales and Related	11,575	E-commerce, digital payments
	Management	9,113	Digital customer relationship management
	Business, legal and financial	4,945	Automated credit fulfilment for loans
Declining Employment	Manufacturing and production	9,342	3-D printing, augmented reality mechanisms, robotics
	Computer, mathematics and science	3,604	Artificial intelligence, advanced machine learning
	Education and training	2,700	Massive online open courses, mobile application based learning, in-classroom ICT use
	Architecture and engineering	2,195	Computer-aided design, intelligent home systems
Uncertain Future of Employment	Farming, fishing and forestry	20,120	Sensing and monitoring, online markets and market information
	Office and administrative	10,317	Artificial intelligence assistants
	Installation and maintenance	5,372	Service through mobile applications, smart systems integration
	Arts, design, entertainment, sports and media	2,712	Digital books, growth of online media, e-sports

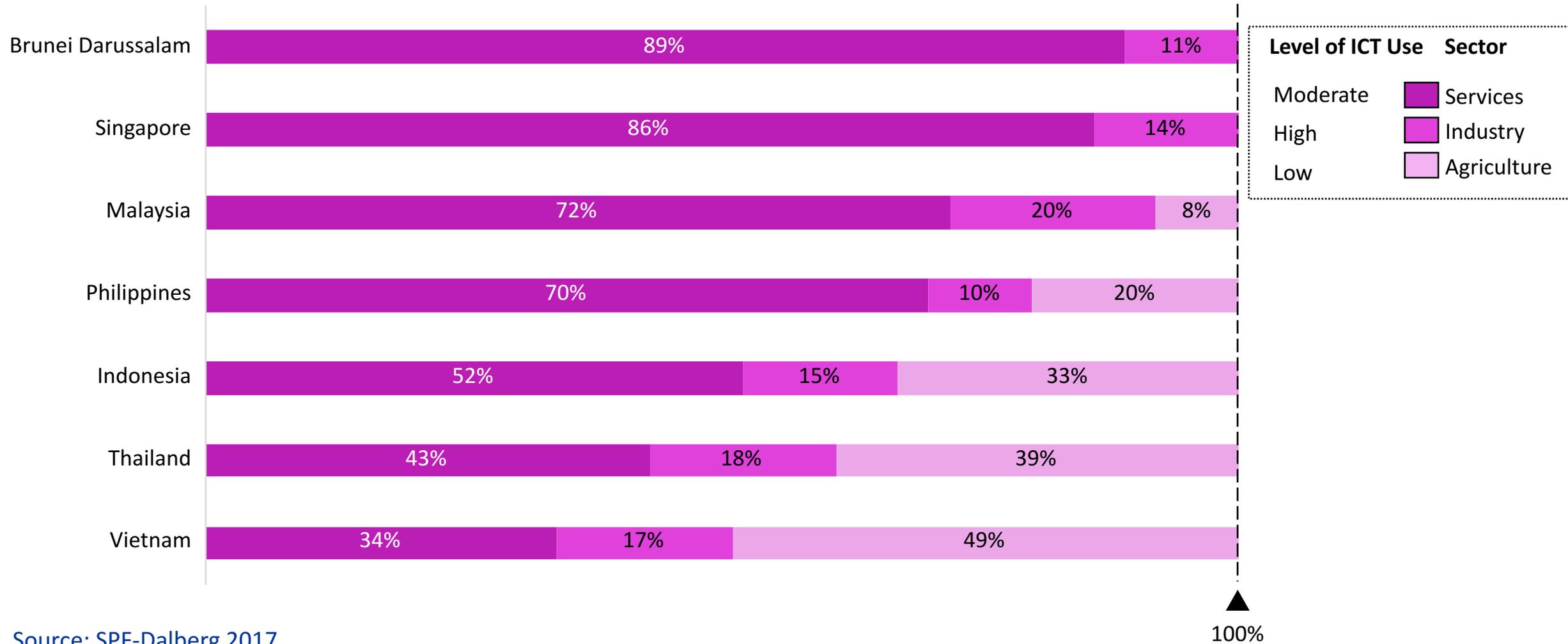
Source: SPF-Dalberg 2017

Mobile phone ownership and Internet usage



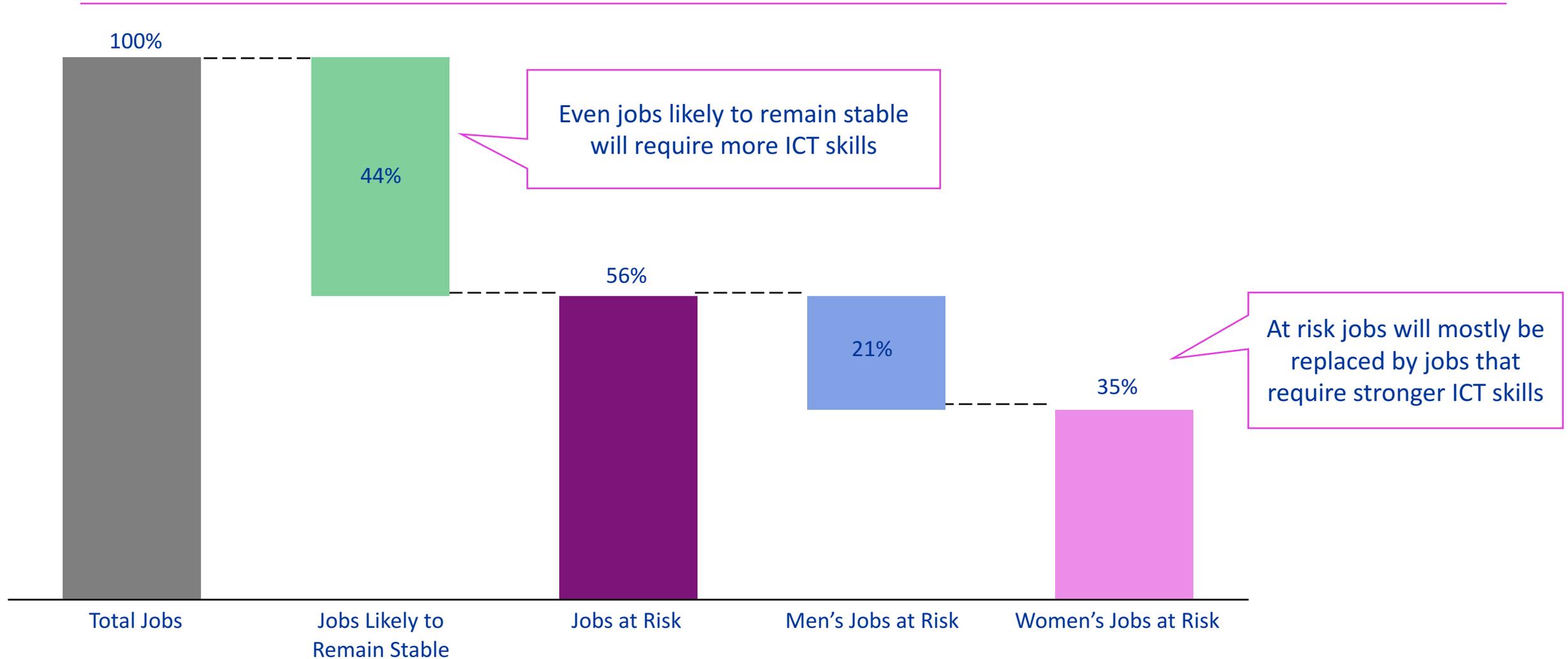
Source: SPF-Dalberg 2017

Sector division of the current female labour force in SE Asia



Source: SPF-Dalberg 2017

Jobs estimated at risk due to automation across SE Asia (%)



Source: SPF-Dalberg 2017

Barriers faced by girls and women that affect ICT and STEM skill adoption and employment



1 Barriers to developing interest in ICT

- Gender biases stereotype technology as a male domain
 - Parents and teachers encourage girls less than boys in pursuing ICT skills education
 - Secondary school girls tend to exhibit lower interest and self-esteem in STEM subjects compared to other subjects
 - Few female role models in technology exist to drive girls' aspirations
 - Girls and women have lower access to ICT tools and connectivity than boys and men

2 Barriers to acquiring ICT skills

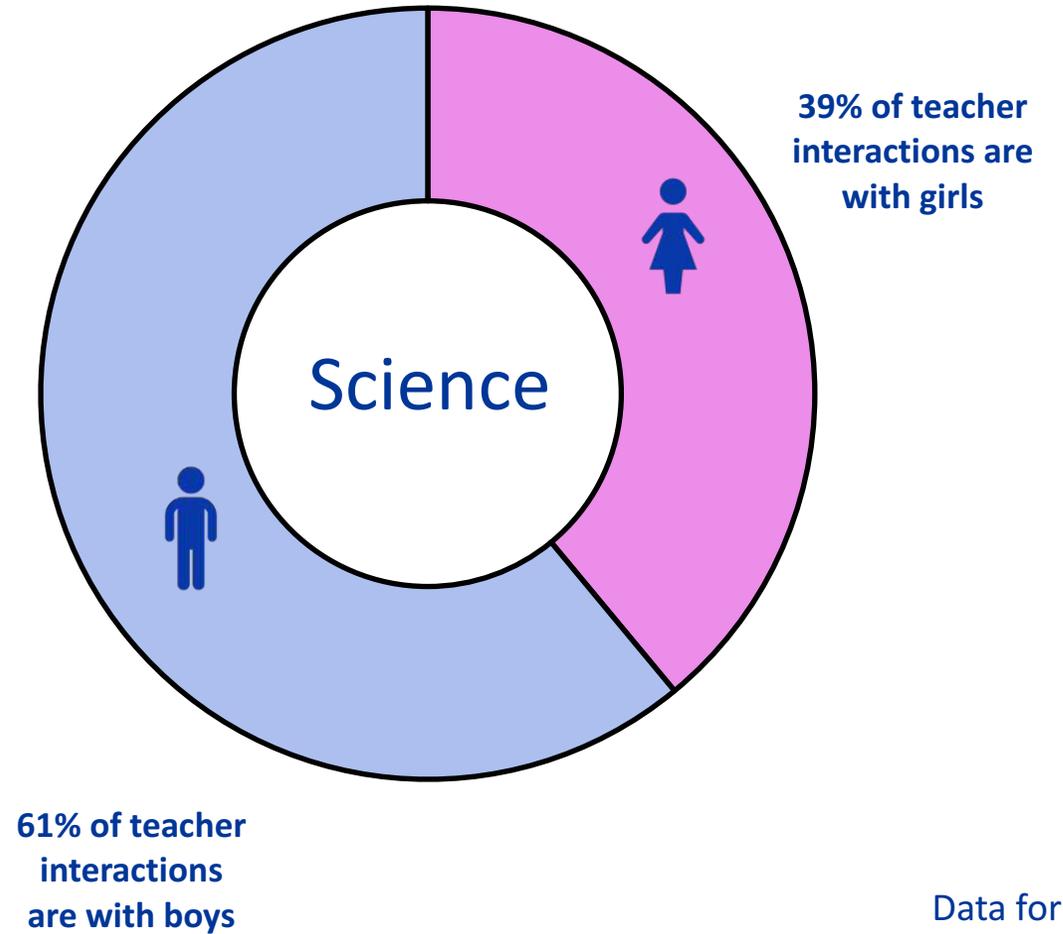
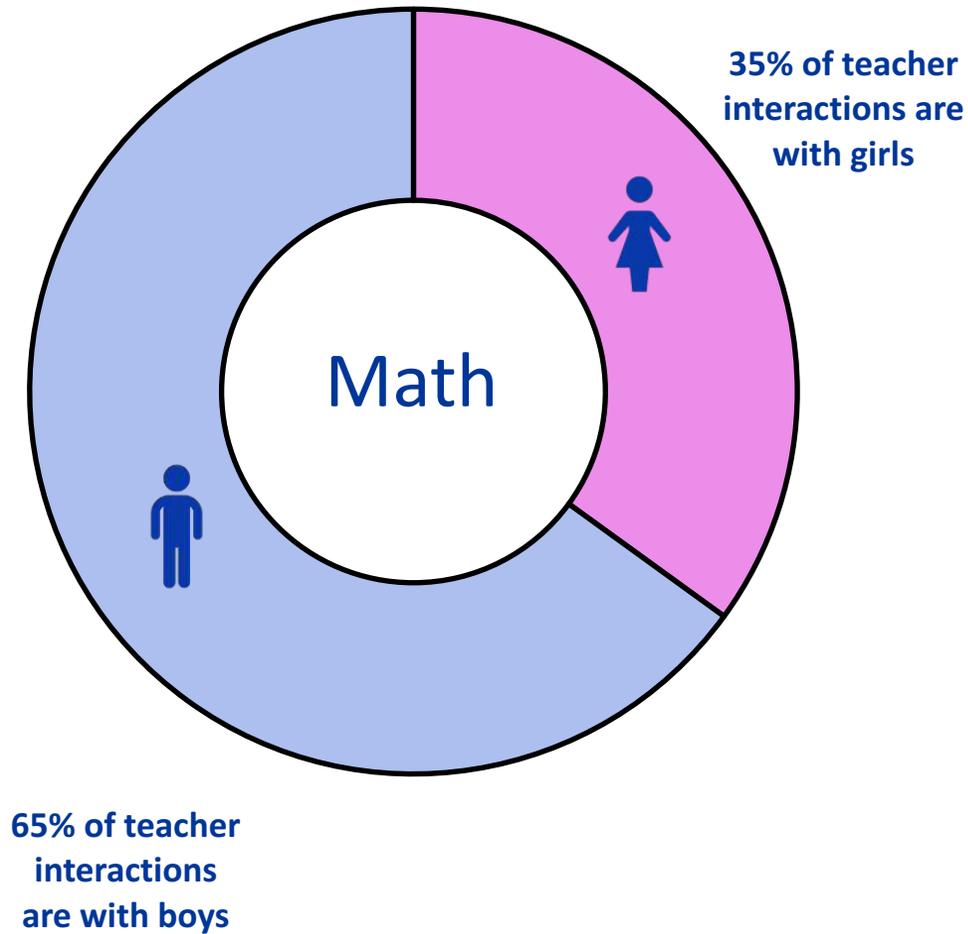
- Girls and women have limited time to pursue ICT skill adoption because they are responsible for over 70% of domestic and care work
- Girls and women have limited mobility, which restricts their access to in person ICT training
- Families spend more on education for boys and men than on education for girls and women (including ICT training)
- Girls and women face online harassment, which limits their online activity to practice ICT skills
- Trainings provide limited gender sensitive content and delivery, which hinders ICT skill adoption

3 Barriers to entering the workforce

- Women perceive existing ICT jobs as unattractive because:
 - Women receive lower wages than men
 - Women gain fewer promotions than men
- Women have weaker networks to leverage in their job search
- Women face gender discrimination in hiring practices

Source: SPF-Dalberg 2017

Teachers interact with boys twice as much as girls for math and science



Data for Vietnam
Source: SPF-Dalberg 2017

The purpose of select programmes that foster ICT skill adoption for girls and women in Southeast Asia

1

Reduce barriers to developing interest in ICT

No surveyed programmes currently have the primary purpose of eliminating gender biases and fostering an interest in ICT for girls and women independent of ICT skill adoption

2

Reduce barriers to acquiring ICT skills

Girls

QUALCOMM
Wireless Reach™

Technovation
Iridescent

girls who
CODE

21C GIRLS

Women

BagoSphere

telecentre.org
Communities Skills Technology People

Hackbright
Academy

WOMEN WHO
CODE

3

Reduce barriers to entering the workforce

BagoSphere

Hackbright
Academy

WOMEN WHO
CODE

Design Principle	Description	Supporting Evidence
<p data-bbox="78 372 163 454">1</p>  <p data-bbox="163 601 639 833">Highlight female role models to increase the confidence of girls and women</p>	<ul style="list-style-type: none"><li data-bbox="733 372 1549 743">• Connecting women with role models in technology-related jobs to share experiences breaks gender stereotypes and allows women to better envision future careers in ICT and STEM fields	<ul style="list-style-type: none"><li data-bbox="1633 372 2466 682">• Profiling successful women in STEM fields as role models resonates with girls aged 17-19 years old and is an effective means of encouraging them to consider STEM careers ¹<li data-bbox="1633 715 2466 892">• Research found that girls and women perform better when they know successful female role models ²

Design Principle

2



Leverage content that portrays ICT as a female domain

Description

- Using customised, gender responsive content that appeals to girls and women improves ICT and STEM learning outcomes for them
- Examples include involving more girls in diagrams in math and computer science classes

Supporting Evidence

- The content of teaching and learning materials, particularly textbooks, perpetuates traditional gender roles and discourages girls from pursuing STEM fields (e.g. in Indonesia, a Grade 7 textbook includes a graphic of only men learning science) ³

Design Principle

Description

Supporting Evidence

3



Reinforce gender sensitive delivery to increase female participation and skill adoption

- Providing professional development to teachers on gender sensitive strategies to involve and cater to girls and women needs ensures greater participation and effectiveness of gender sensitive content
- Examples include teachers explicitly interacting with and calling on girls during ICT and STEM classes or scheduling evening classes for working women

- Math and science teachers interact with boys twice as much as with girls in some Southeast Asian classrooms, resulting in lower participation, learning outcomes and interest from girls in these classes ⁴

Design Principle

4



**Level the playing field
for women around
access to ICT**

Description

- Girls and women face difficulty in accessing the tools and connectivity needed to benefit from ICT-oriented programmes (e.g. computers, mobile phones, the Internet)
- Affordability of devices and network/data connections is a major deterrent for women

Supporting Evidence

- Women face a gender gap of up to 5 percentage points in access to the Internet and mobile phone ownership ^{5, 6}
- Interviews suggest that even when women own ICT devices, men and children may use them more than women themselves ⁷

Fostering ICT skill adoption for girls and women



<p><i>Type of Role</i></p> <p> <i>Primary</i> <i>Supporting</i> </p>	<p>1 Reduce barriers to developing interest in ICT</p>	<p>2 Reduce barriers to acquiring ICT skills</p>	<p>3 Reduce barriers to entering the workforce</p>
<p> Policymakers</p>	<ul style="list-style-type: none"> Explore a rights-based approach to enable access to ICT tools and connectivity for women 	<ul style="list-style-type: none"> Review school curricula to ensure gender sensitivity and sustained integration of ICT Mandate ICT education in existing government skills programmes, with an emphasis on girls and women 	<ul style="list-style-type: none"> Support policy to improve workplace gender equality and fair hiring practices Engage the private sector to assess national skill needs
<p> Philanthropies</p>	<ul style="list-style-type: none"> Generate thought leadership on the impact and strategies of mitigating and reversing negative gender biases that prevent women from pursuing ICT skills and work 	<ul style="list-style-type: none"> Research and disseminate findings on increasing women’s adoption of ICT skills 	<ul style="list-style-type: none"> Build networks between organisations to link women from ICT training to workforce entry
<p> Private sector businesses</p>	<ul style="list-style-type: none"> Highlight successful female role models who use ICT 	<ul style="list-style-type: none"> Train existing employees and women in supply chains on ICT skills, particularly basic and applied ICT skills 	<ul style="list-style-type: none"> Partner with ICT training programmes to hire more women Provide options to work virtually

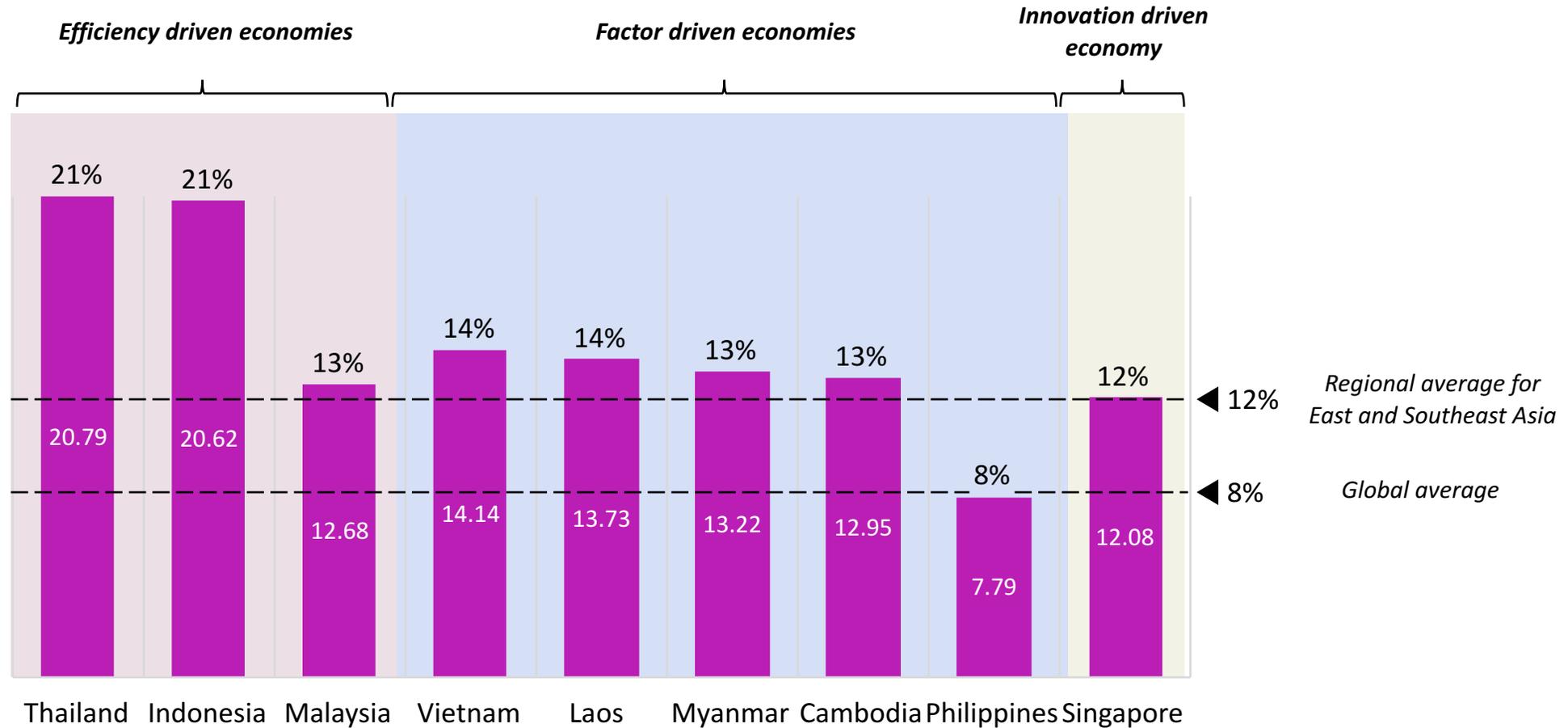
Growing Women's Entrepreneurship through ICT in Southeast Asia



Rates of female entrepreneurship and proportion of informal businesses across SE Asia



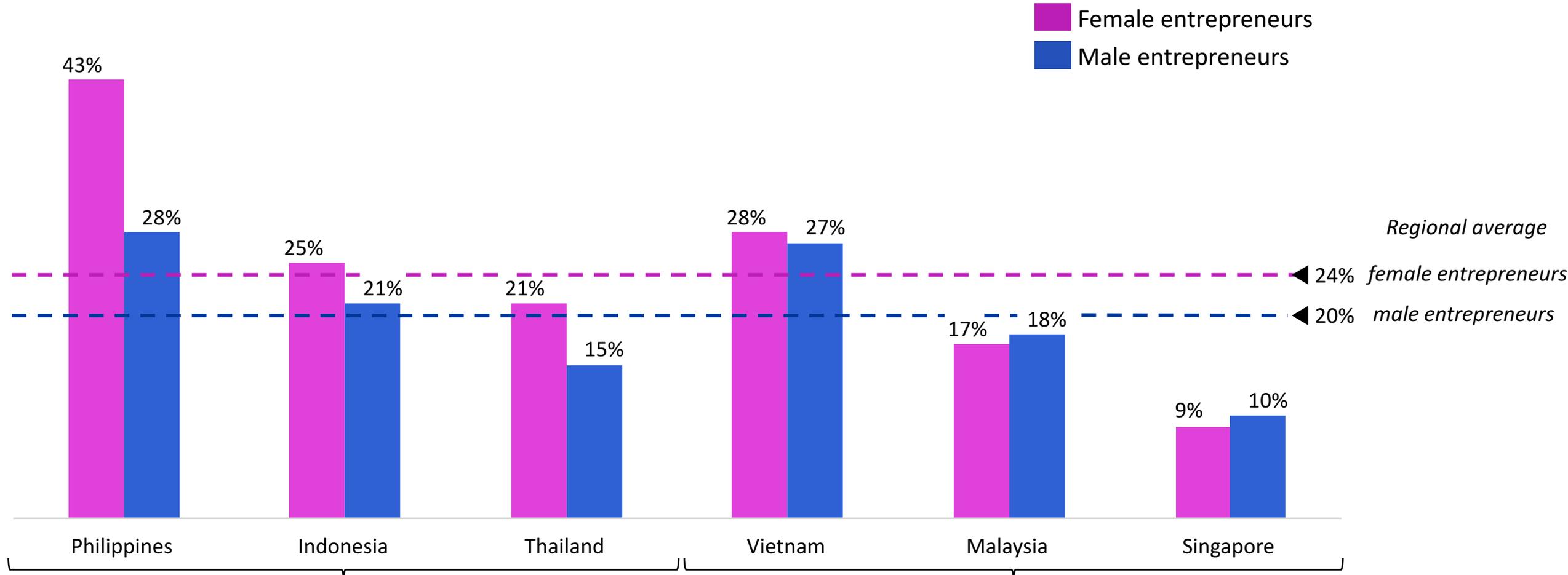
Percentage of women who are entrepreneurs



The number of informal, micro-, small- and medium-sized businesses owned by women (in millions)

5.1	16.6	1.2	4.4	0.3	2.3	0.6	2.3	0.2
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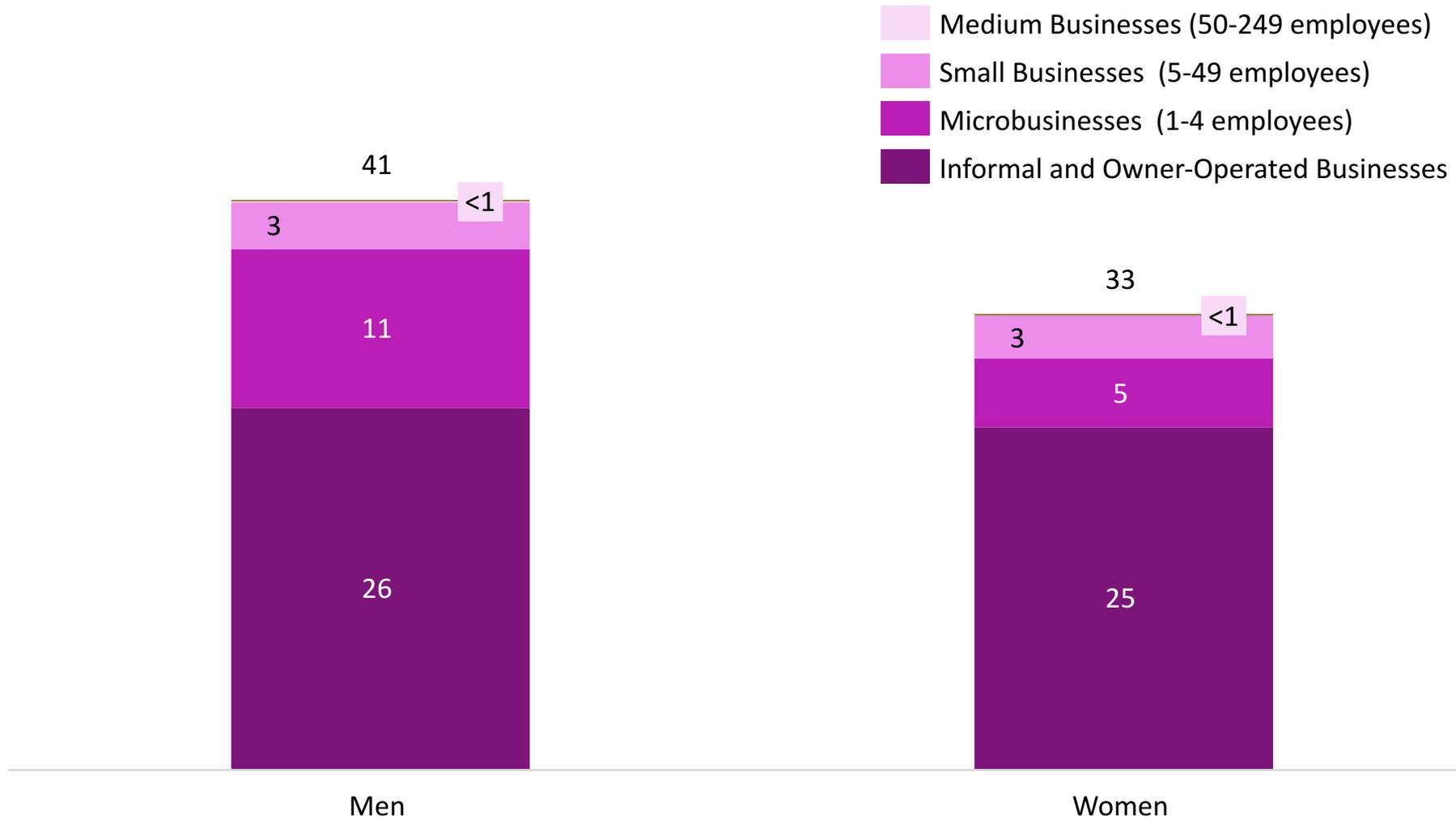
Percentage of female and male entrepreneurs who start a business due to a lack of alternate employment options



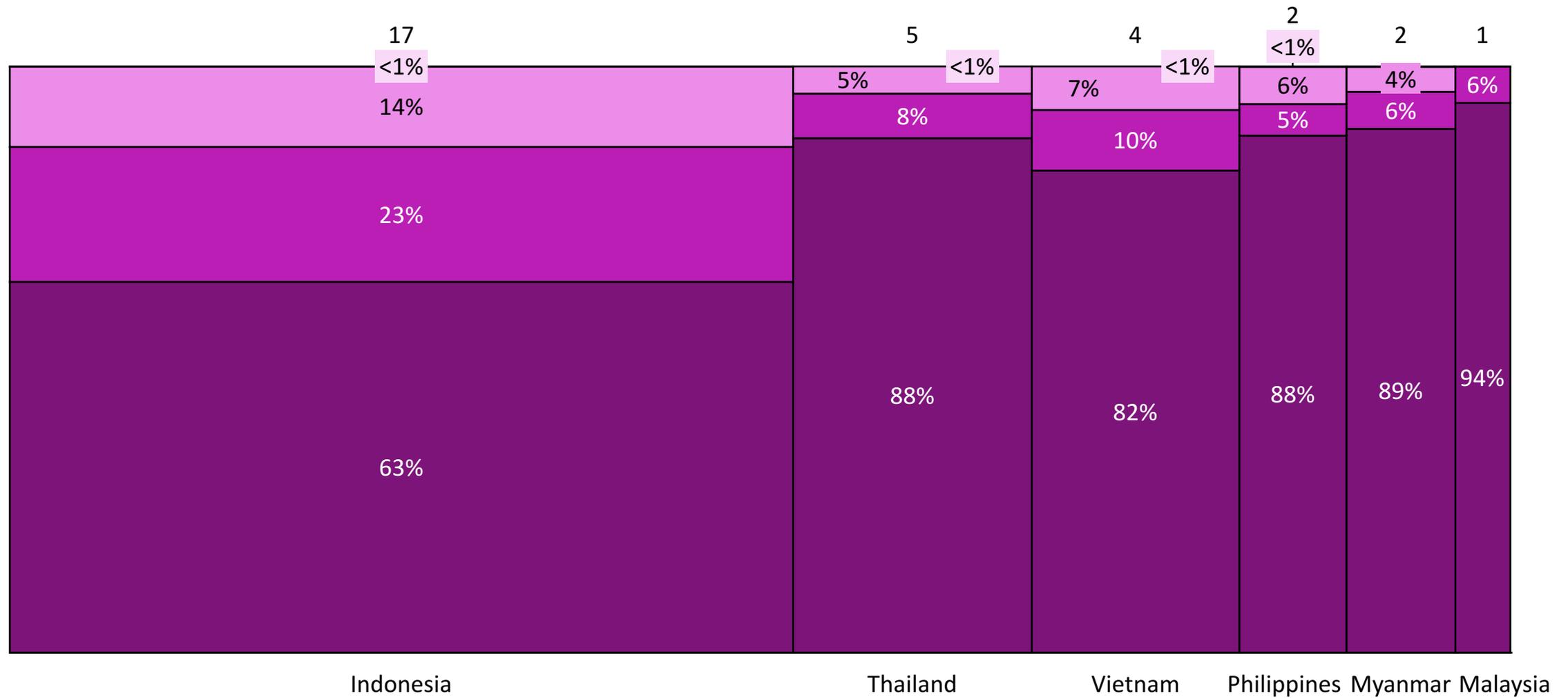
More women than men start businesses out of necessity

Nominal difference between women and men who start businesses out of necessity

Women-owned and men-owned businesses differ in scale in Southeast Asia (in millions)



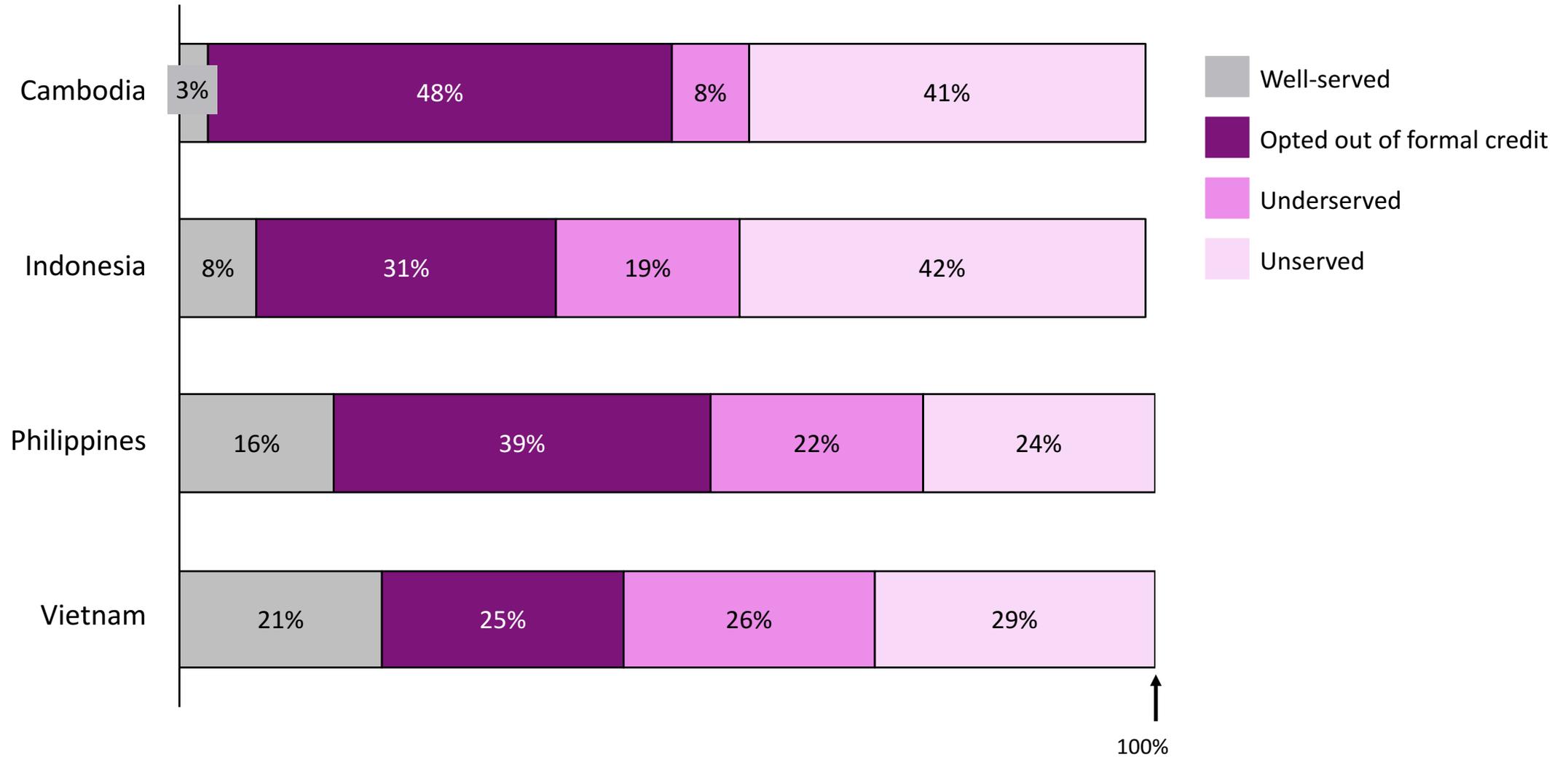
Women-owned businesses by firm size across six SE Asian markets and total number of MSMEs



Medium Businesses
 Small Businesses

Microbusinesses
 Informal and Owner-Operated Businesses

Female entrepreneurs' access to formal credit



Source: SPF-Dalberg 2017

How ICT can help female entrepreneurs grow their business



	Increase Anonymity and Reduce Gender Biases	Connections and Knowledge Sharing	Flexibility to Shift Time and Place	Time and Cost Efficiencies	
Barriers	Women have lower access to finance than men	Customised, digital credit scoring for women based on past transactions or mobile history can allow women better loan terms	Online crowdfunding can provide funding solely for women and diversifies women's funding sources	Digital finance services allow women to circumvent local institutions that may discriminate against them	Digital loan applications shorten disbursement times
	Women have lower access to markets than men		E-commerce allows women to access a global customer base and better market information	E-commerce allows women to sell from anywhere and anytime	E-commerce allows women to reduce the time and cost to serve customers
	Women face difficulty gaining skills to grow a business		Virtual mentoring allows women to ask questions and reinforce learning skills	E-learning allows women to pursue training anywhere and anytime	E-learning reduces the time and cost for women to travel to training

Source: SPF-Dalberg 2017

How ICT can help female entrepreneurs grow their business



	Increase Anonymity and Reduce Gender Biases	Connections and Knowledge Sharing	Flexibility to Shift Time and Place	Time and Cost Efficiencies
Women are perceived as less capable business leaders	E-commerce can mask the seller's gender, which allows women to reduce discrimination from male suppliers and customers	Promoting female entrepreneur role models through ICT increases women's confidence and motivation to pursue entrepreneurship		
Women do 70% of the domestic / care work		ICT-based messaging can advocate for shared domestic responsibilities	ICT allows female entrepreneurs the ability to work flexible hours and from home	
Women have lower mobility than men		Social media enables female entrepreneurs to network from home	Digital fulfillment and e-commerce allows women to access finance and markets from home	Digital fulfillment enables women to access inputs and markets more quickly and affordably from home

Socio-Cultural Root Causes

Source: SPF-Dalberg 2017

Programme learnings from SE Asia



Case Study

Business Woman (Usaha Wanita)

Mobile Microfranchising

Mentoring Women in Business

Overview

Business Woman (Usaha Wanita) is a mobile information service that delivers relevant business setup and management information to female entrepreneurs

The Grameen Foundation helped female entrepreneurs to start and grow small scale telecommunication businesses

The Mentoring Women in Business programme virtually connected mentors from around the world to budding Malaysian female entrepreneurs

Reach

Over 14,000 women

12,000 women

200 mentor-mentee pairs

Entrepreneurship/ Employment Outcomes

98% of mentee graduates built business skills that can be leveraged to grow a business

100% of female entrepreneurs reported a profit from the businesses they started

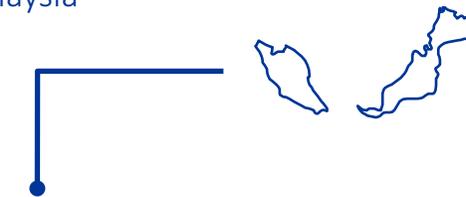
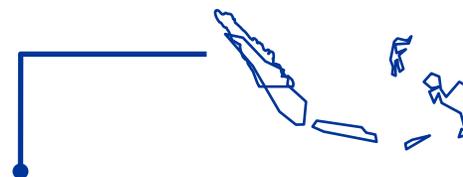
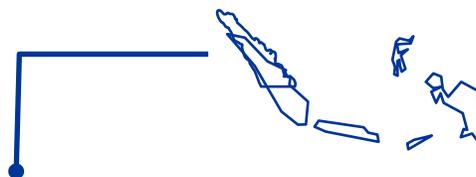
95% of mentees have grown their networks and business contacts

Location

Indonesia

Indonesia

Malaysia



Key learning

Country-specific, relevant content covered practical guidance to address real-world business challenges (e.g. sources of capital, customer relationship management)

Selling to other women helped drive the profitability of businesses since women were more likely to buy from other women

Upfront mentee training in ICT improved learning outcomes and ensured mentees had the digital literacy skills needed to benefit from virtual mentoring

Design principles for ICT orientated programmes to support women entrepreneurs



Design Principle

1



Family-centric approach

Description

- A family centric approach, which accounts for and addresses women's domestic responsibilities
- Examples include providing flexible online training schedules or a crèche during entrepreneurship programmes

Supporting Evidence

- Data suggests that one of the main reasons Southeast Asian women discontinue businesses is due to balancing work and family responsibilities. Including family members in business and training activities can help women combine or decrease their responsibilities and sensitise men ^a

Design principles for ICT orientated programmes to support women entrepreneurs



Design Principle

2



Provide women with access to ICT devices and connectivity

Description

- Women face difficulty in accessing the hardware and software needed to benefit from ICT-oriented programmes (e.g. computers, mobile phones, the Internet)
- Affordability of devices and network/data connections is still a major deterrent

Supporting Evidence

- Women face a gender gap of up to 5 percentage points in access to the Internet and mobile phone ownership ^{b,c}
- Interviews suggest that even when women own ICT devices, men and children may use them more than women themselves ^d

Design principles for ICT orientated programmes to support women entrepreneurs



Design Principle

3



Build lasting women's networks

Description

- Interventions need to provide support for women entrepreneurs after training ends to clarify follow-up questions, address business challenges and develop lasting networks of female entrepreneurs

Supporting Evidence

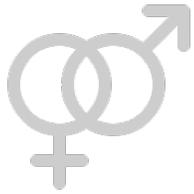
- Women entrepreneurs have low access to business networks
- Interviews with programme leaders revealed that women benefitted from trainings but found that they desired additional support after the programme ended and opportunities to network with other women

Design principles for ICT orientated programmes to support women entrepreneurs



Design Principle

4



Support women in overcoming socio-cultural norms and biases

Description

- Women's ability to start and grow their business as well as their access to and usage of ICT is highly dependent on socio-cultural norms within specific regions, towns and villages
- Programme leaders are increasingly aware of the need to address women's own confidence to build broader societal support for female entrepreneurship and ICT use

Supporting Evidence

- Interviews suggest that women benefit from practical strategies that allow them to confront and change norms that may restrict entrepreneurship (e.g. teaching women how to persuade and negotiate in their social setting to allow them greater access to business inputs)

Key roles for policymakers, philanthropies and private sector businesses to scale women-owned businesses



<i>Type of Role</i>				
		Policymakers	Philanthropies	Private Sector Businesses
<i>Primary</i>	<i>Supporting</i>			
Barriers	Women have lower access to finance than men	Enable digital mechanisms for women to access finance and create more flexible lending for women	Create digital funding platforms for women (e.g. online crowdsourcing)	Enable digital mechanisms for women to access finance and create more flexible lending for women from private banks
	Women have lower access to markets than men	Simplify e-registration of informal businesses to help government procure from more women-owned MSMEs	Match female entrepreneurs with virtual information and networks to access greater markets	Prioritise sourcing from women via e-commerce platforms
	Women face difficulty gaining skills to grow a business	Standardise and distribute at scale blended skills training for women to grow businesses	Curate training content for the government and businesses to distribute based on a distillation of past learnings and best practices	Invest in digitally training women-owned business suppliers
Prerequisite	 Enable access to ICT tools and connectivity			

Key roles for policymakers, philanthropies and private sector businesses to scale women-owned businesses



		<i>Type of Role</i>		
		 Primary	 Supporting	
		Policymakers	Philanthropies	Private Sector Businesses
Socio-Cultural Root Causes	Women are perceived as less capable business leaders	Form partnerships with media producers and outlets to prioritise public awareness and advocacy campaigns around changing socio-cultural norms to foster female entrepreneurship	Execute ICT and media-based public awareness and advocacy campaigns that change socio-cultural norms to foster female entrepreneurship	Leverage popular brands for ICT and media-based public awareness and advocacy campaigns that change socio-cultural norms to foster female entrepreneurship
	Women do 70% of the domestic / care work			
	Women have lower mobility than men			
Prerequisite	 Enable access to ICT tools and connectivity			

Research reports on Southeast Asia



Advancing Women's Empowerment

GROWING WOMEN'S ENTREPRENEURSHIP THROUGH ICT IN SOUTHEAST ASIA

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Advancing Women's Empowerment

ICT SKILLS FOR GIRLS AND WOMEN IN SOUTHEAST ASIA

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Why Women Aren't Where They Are Needed in the Workforce: Putting the Pieces Together

*Patricia Rankin, Donna Caccamise
University of Colorado Boulder*



The Impact of Unconscious Bias on Women's Career Advancement

*Amarette Filut, Anna Katz, Molly Carnes
University of Wisconsin Madison*



SPF Workshop on Gender Assessment and Evaluation



Sharing of best practices for assessment and evaluation in the HE sector from Japan, UK, & Singapore (Tokyo, May 2017)



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