Fundación iMaterna

ISPA Instituto de Investigación Sanitaria del Principado de Asturias

Control de calidad del cribado de preeclampsia
Análisis secundario del estudio PREVAL

Valeria Rolle
Diana Cuenca
Katy de Paco
Nuria Valiño
Rocío Revello
Begoña Adiego
Belén Santacruz
María del Mar Gil

Hospital Universitario de Torrejón – SaludMadrid – Comunidad de Madrid

Hospital Universitario Fundación Alcorcón – SaludMadrid – Comunidad de Madrid

Arrixaca – Hospital Universitario "Virgen de la Arrixaca"

Hospital Universitario Quirón Madrid

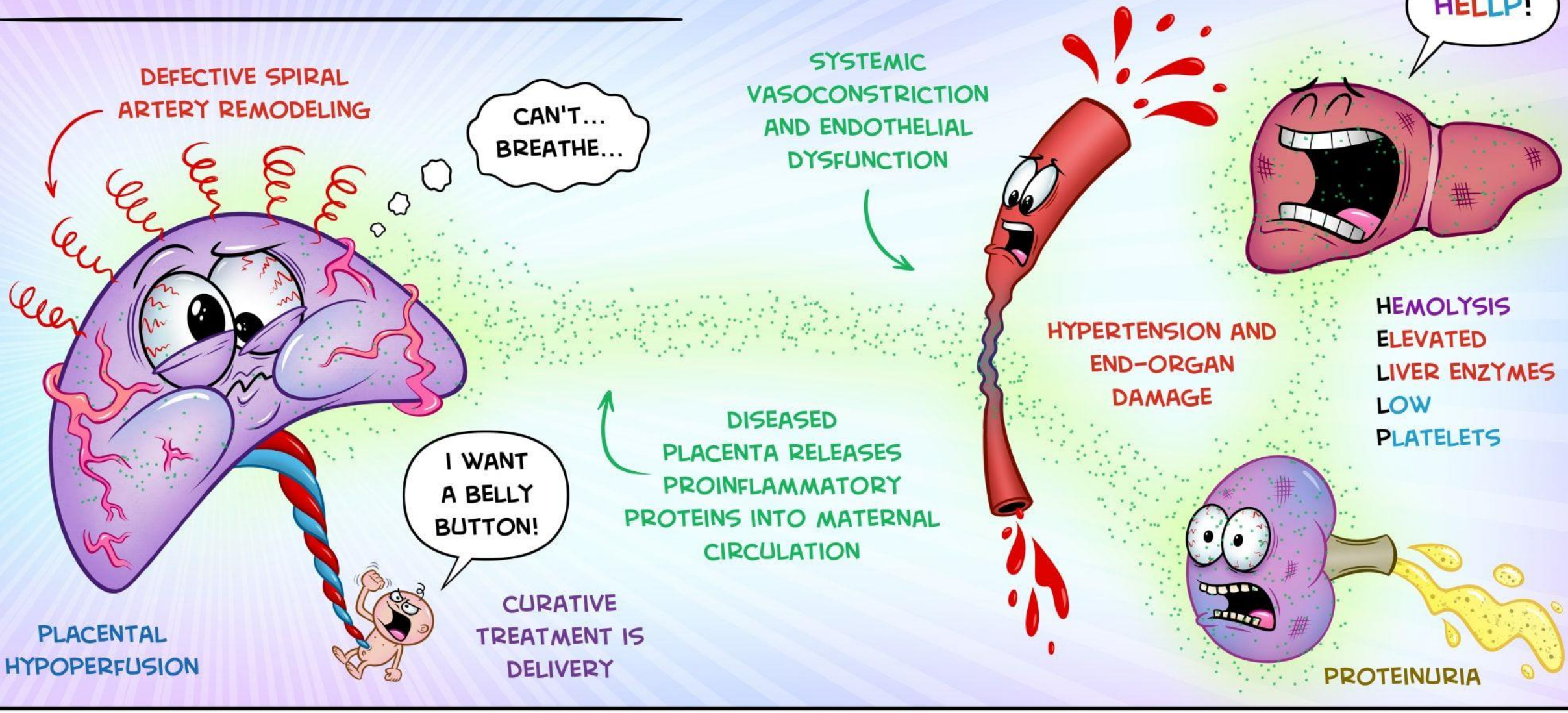
Servizo Galego de Saúde | Complexo Hospitalario Universitario A Coruña

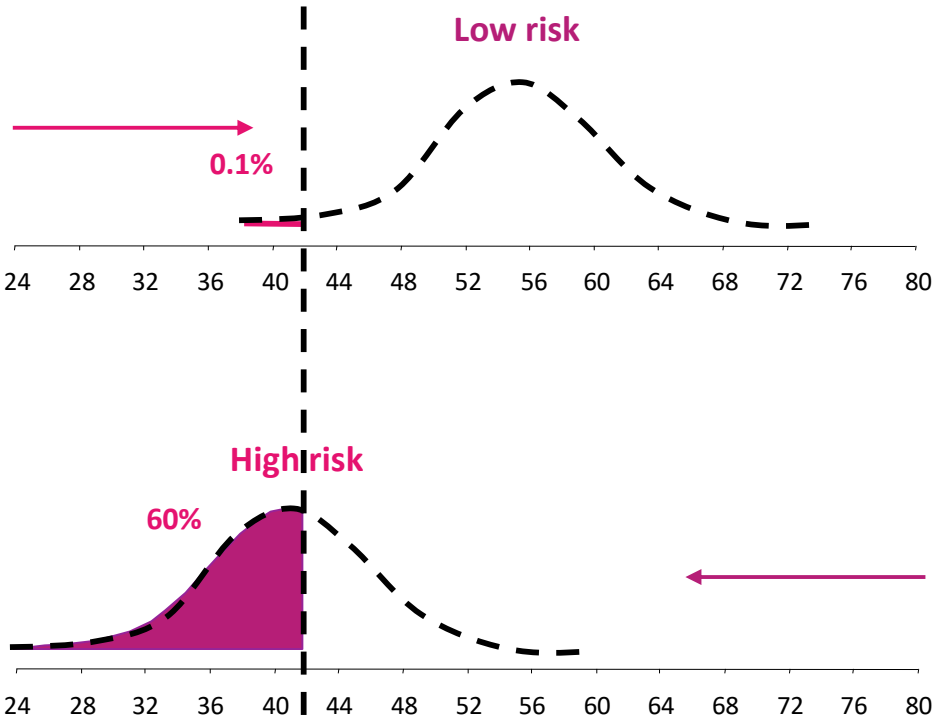
Vall d'Hebron Hospital Àrea Materno-infantil

ThermoFisher Scientific

Gobierno de España – Ministerio de Ciencia, Innovación y Universidades

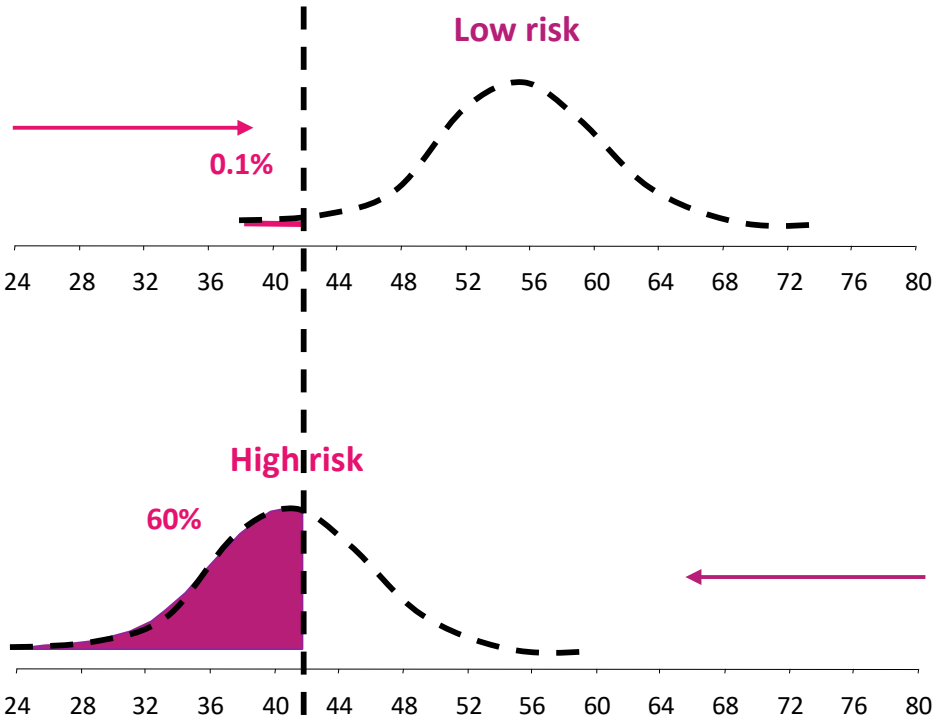
PREECLAMPSIA: PATHOPHYSIOLOGY

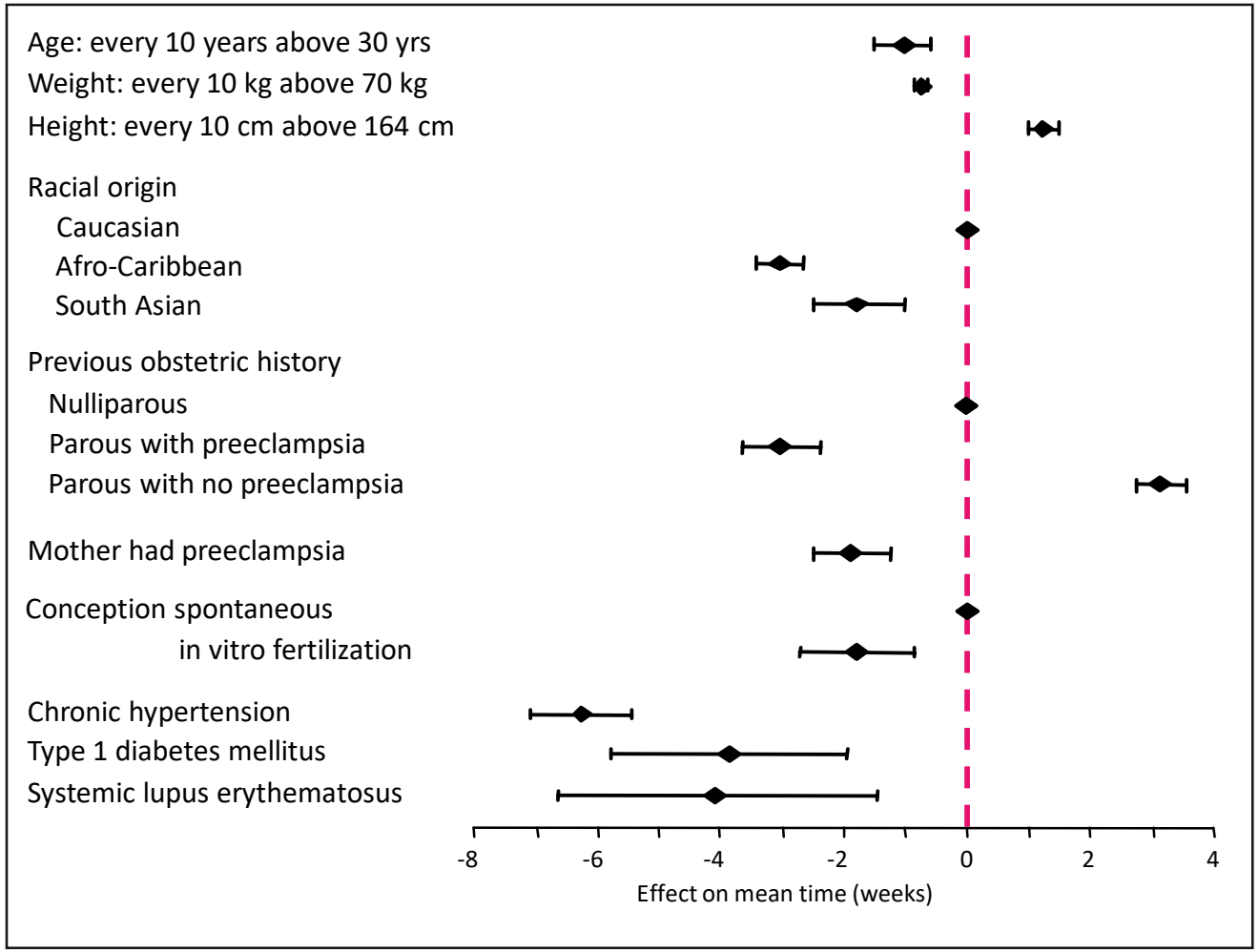



Low risk
0.1%
24 28 32 36 40 44 48 52 56 60 64 68 72 76 80
High risk
60%
24 28 32 36 40 44 48 52 56 60 64 68 72 76 80
Gestation at delivery with PE (wks)

Fundación iMaterna

ISPA Instituto de Investigación Sanitaria del Principado de Asturias





Fundación iMaterna

PREVAL

ISPA Instituto de Investigación Sanitaria del Principado de Asturias

Multicéntrico
Prospectivo
Se recogen:
- **Factores maternos**
- **Presión arterial media**

Poon 2012

- **Índice pulsatilidad arterias uterinas**

Plasencia 2007

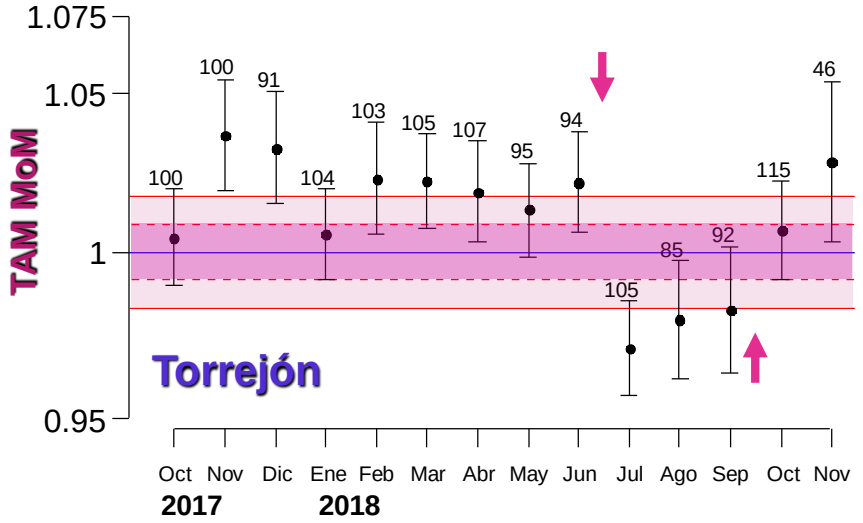
- **PlGF**
- **PAPP-A**

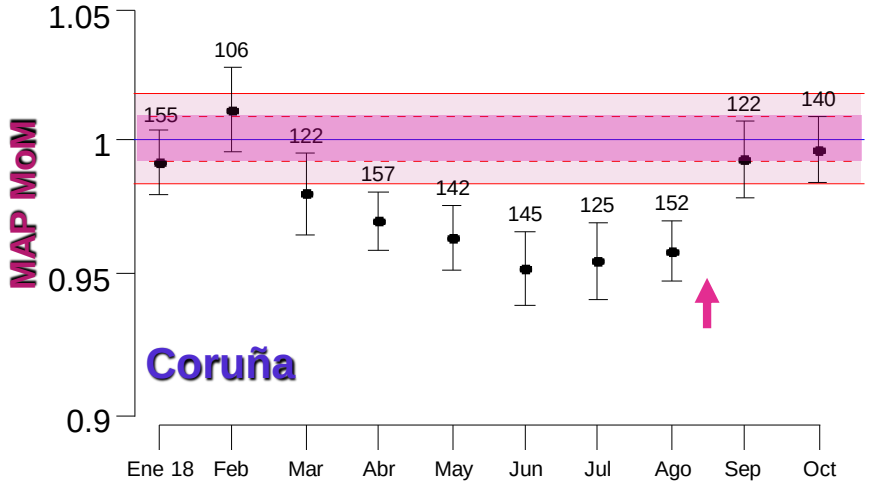
PREVAL

Características maternas; n = 5.874	
Edad (años)	33,9 (30,1 – 36,9)
Peso (kg)	64,0 (57,2 – 73,1)
Altura (cm)	163 (159 – 167)
Edad gestacional (semanas)	12,7 (12,3 – 13,1)
Concepción espontánea	5,358 (91,2)
Nulíparas	2,986 (50,8)
Raza blanca	5,731 (97,6)
Fumadoras	716 (12,2)
LES / SAF	32 (0,5)
Diabetes mellitus	51 (0,9)
Hipertensión crónica	58 (1,0)
Toma de aspirina	295 (5%)

Mediana (RIQ) o N (%)

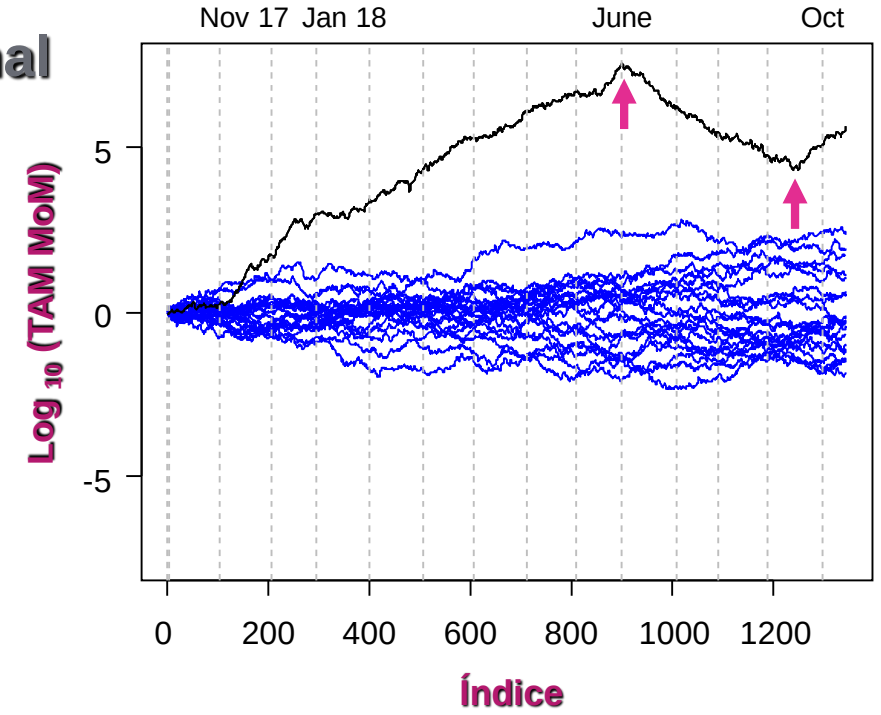
Fundación iMaterna

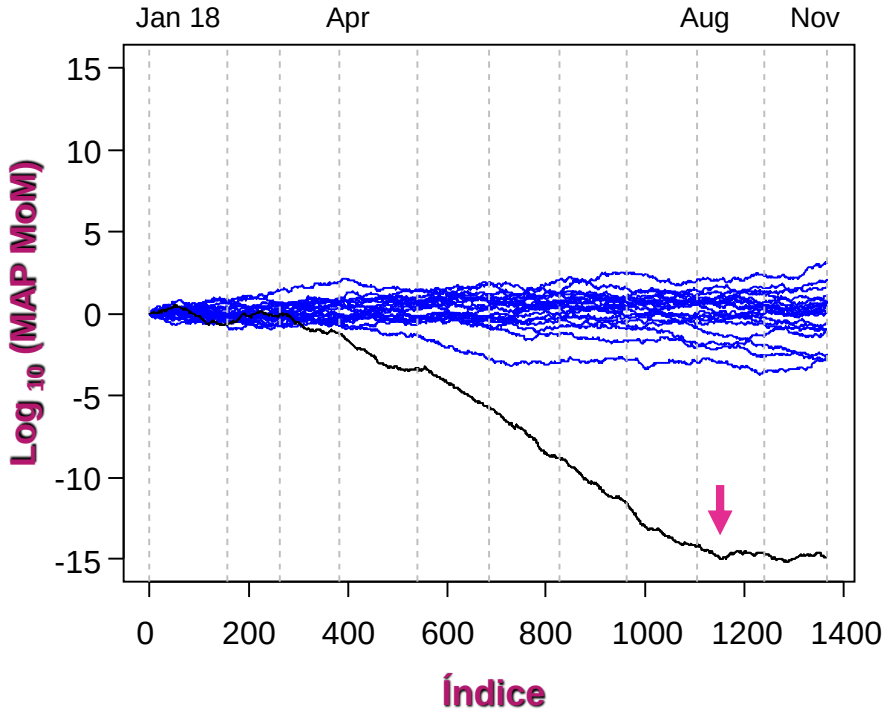




Necesidad de auditoría mensual:

- Volver a entrenar personal
- Ajuste de MoMs

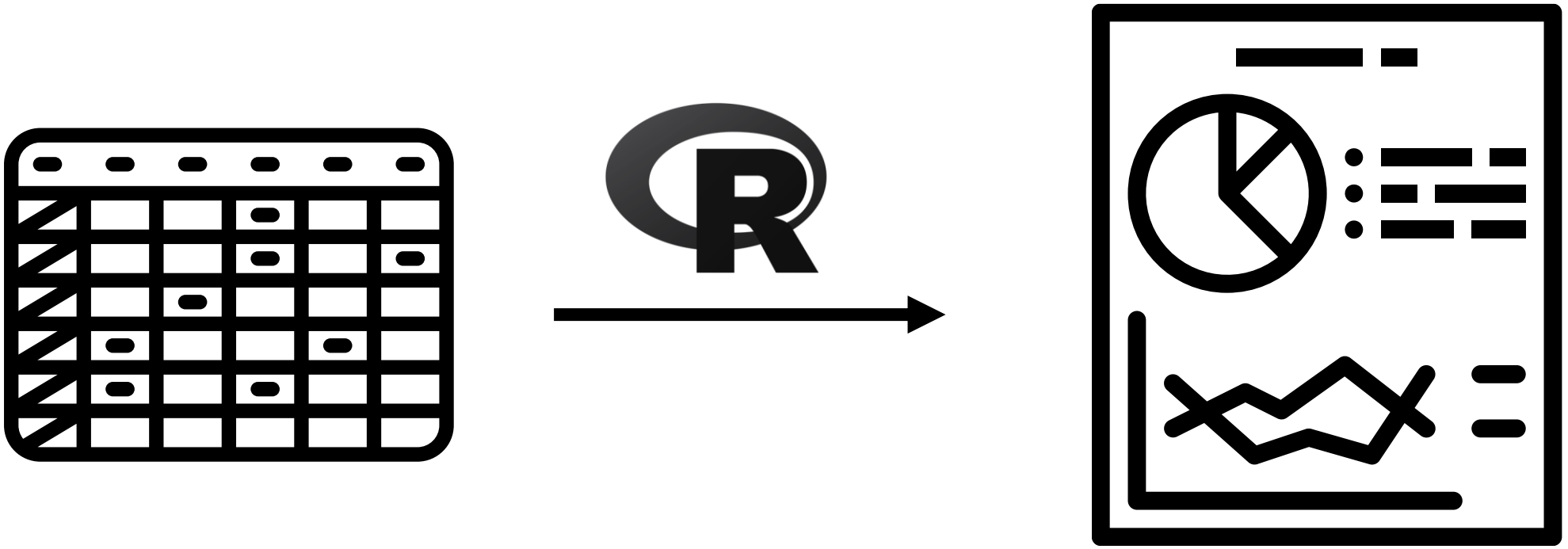




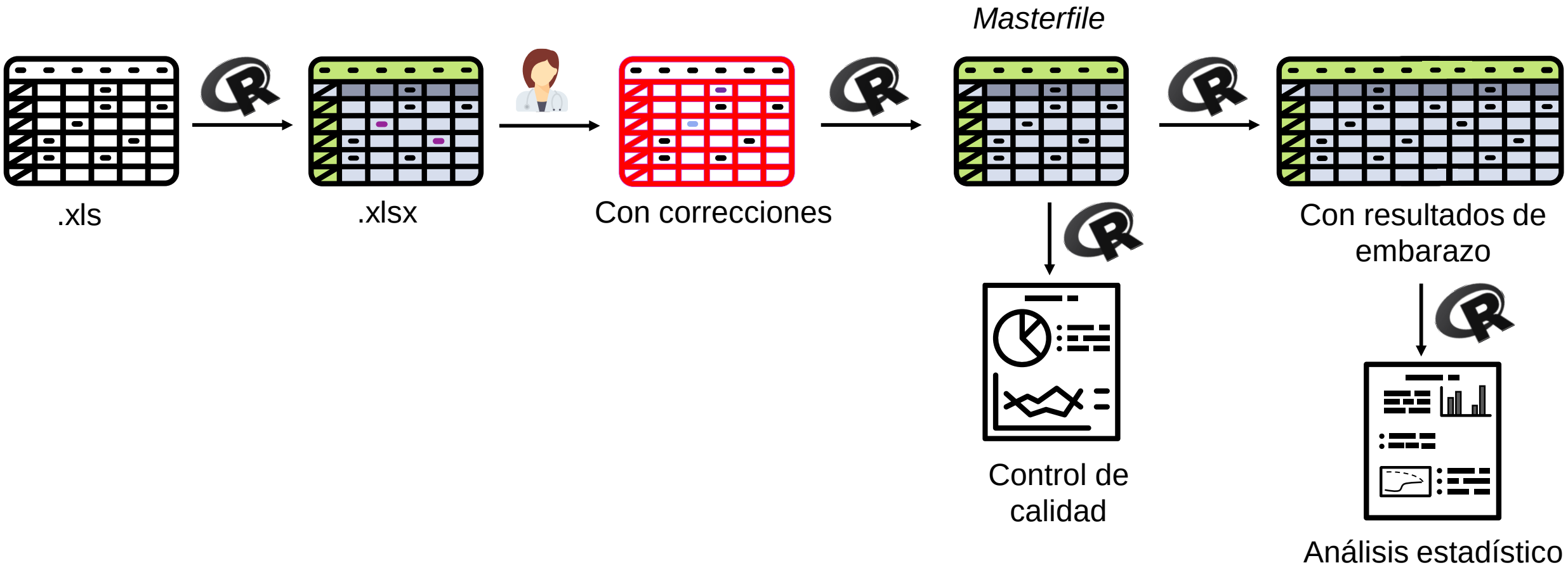
Fundación iMaterna

Situación ideal

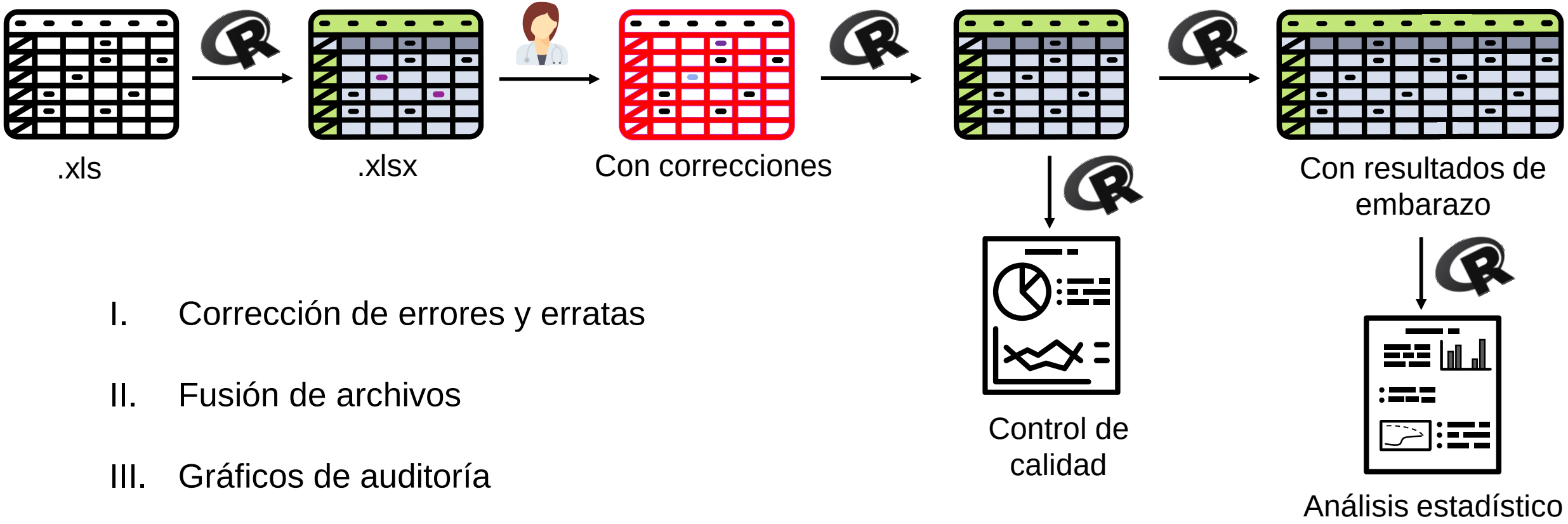
ISPA Instituto de Investigación Sanitaria del Principado de Asturias



Situación real



Situación real

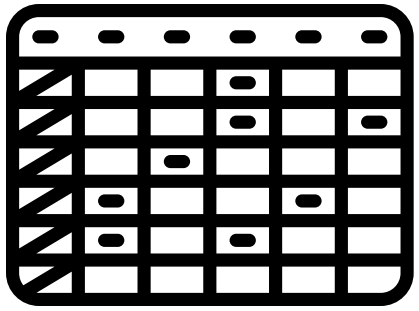


I. Corrección de errores y erratas

II. Fusión de archivos

III. Gráficos de auditoría

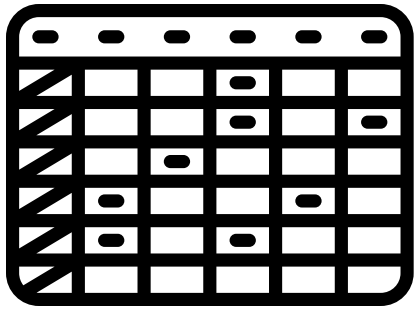
Errores y erratas



.xls

```
dd1$com <- ifelse(dd1$peso > 150 | dd1$peso < 35, paste(dd1$com, "peso",    sep = ", "), dd1$com)
dd1$com <- ifelse(dd1$altura > 215 | dd1$altura < 120, paste(dd1$com, "altura",  sep = ", "), dd1$com)
dd1$com <- ifelse(is.na(dd1$dm), paste(dd1$com, "DM“, sep = ", "), dd1$com)
dd1$com <- ifelse(is.na(dd1$hta), paste(dd1$com, "HTA", sep = ", "), dd1$com)
```

Errores y erratas

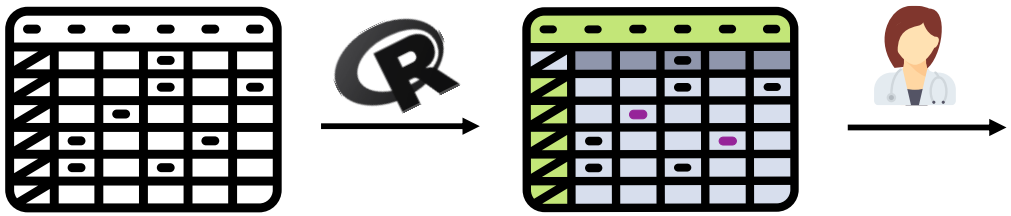


.xls

```
dd1$com <- ifelse((dd1$pe_ant_2    == "Nulip"  &
                   dd1$cir_previo == "Nulip"  &
                   dd1$paridad    == "Nulip") &
                  (dd1$emb1_pn != 171717.17 | dd1$emb2_pn != 171717.17),
                   paste(dd1$com, "tiene info sobre emb anterior", sep = ", "),
dd1$com)
```

Errores y erratas

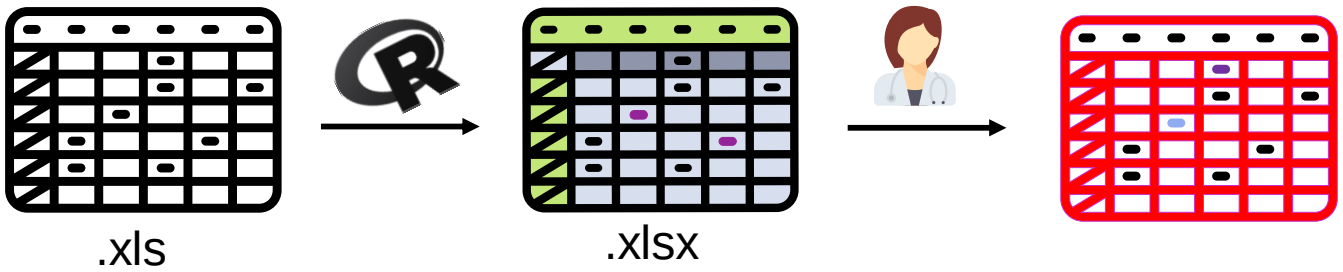
Comentarios	Fecha_US	Case_N	DOB	Indicacion	Método	Concepcion	Ind_ovulac	Tabaco	Alcohol	Raza	Paridad	Drogas	DM
nulip con nacido vivo, ind. Ovul	3/5/18	2	1/2/92		ECO TA	espontáneo		no	no	Blanco	Nulip	no	no
	3/5/18	2	16/2/94	CPT	ECO TA	espontáneo	no	no	no	Negro	Nulip	no	no
	3/5/18	1	12/9/75	CPT	ECO TA	FIV	no	no	no	Blanco-Negro	Nulip	no	no
último parto en 1931	3/5/18	1	18/3/88	CPT	ECO TA	espontáneo	no	fumador	no	Blanco	Multip	no	no
raza, drogas	3/5/18	1	14/10/88	CPT	ECO TA	espontáneo	no	no	no		Nulip		no
	3/5/18	1	5/12/95	CPT	ECO TA	espontáneo	no	no	no	Negro	Nulip	no	no
	3/5/18	1	28/1/83	CPT	ECO TA	espontáneo	no	no	no	Blanco	Nulip	no	no
	3/5/18	1	18/9/87	CPT	ECO TA	espontáneo	no	no	no	Blanco	Nulip	no	no
	3/5/18	1	10/1/96	CPT	ECO TA	espontáneo	no	fumador	no	Blanco	Multip	no	no
ind. ovulación	3/5/18	1	10/5/78	CPT	ECO TA	FIV		no	no	Blanco	Multip	no	no
nulip con nacido vivo, ind. ovul	3/5/18	1	26/6/87	CPT	ECO TA	espontáneo		no	no	Blanco	Nulip	no	no
	3/5/18	1	29/1/88	CPT	ECO TA	espontáneo	no	fumador	no	Blanco	Nulip	no	no
tabaco, ind. ovulación	3/5/18	1	21/6/87	CPT		espontáneo		no - fumador	no	Blanco	Nulip	no	no
tabaco, ind. Ovulación	3/5/18	1	27/2/89	CPT		espontáneo		no - fumador	no	Blanco	Nulip	no	no
	4/5/18	1	24/6/85	CPT	ECO TA	espontáneo	no	no	no	Blanco	Multip	no	no
ind. ovulación	4/5/18	2	6/10/84			espontáneo		no	no	Blanco	Nulip	no	no
ind. ovulación	4/5/18	2	2/10/78		ECO TA	espontáneo		no	no	Blanco	Nulip	no	no
ind. ovulación	4/5/18	2	11/12/93			espontáneo		no	no	Blanco	Nulip	no	no
nulip con nacido vivo, ind. ovul	4/5/18	1	21/6/81			espontáneo		no	no	Blanco	Nulip	no	no
ind. ovulación	4/5/18	1	4/1/82		ECO TA Y T	espontáneo		no	no	Blanco	Nulip	no	no
	8/5/18	1	3/2/82	CPT	ECO TA	espontáneo	no	no	no	Blanco	Multip	no	no



.xls .xlsx

Errores y erratas

Raza	Freq.
Asian oriental	1
Asiático orienta	2
blanco	1
Blanco	2256
Blanco-Asiático oriental	3
Blanco-Negro	6
Asiático del sur	5
Mezcla	15
negro	1
Negro	32
Sudasiatico	1
Sudasiático	3

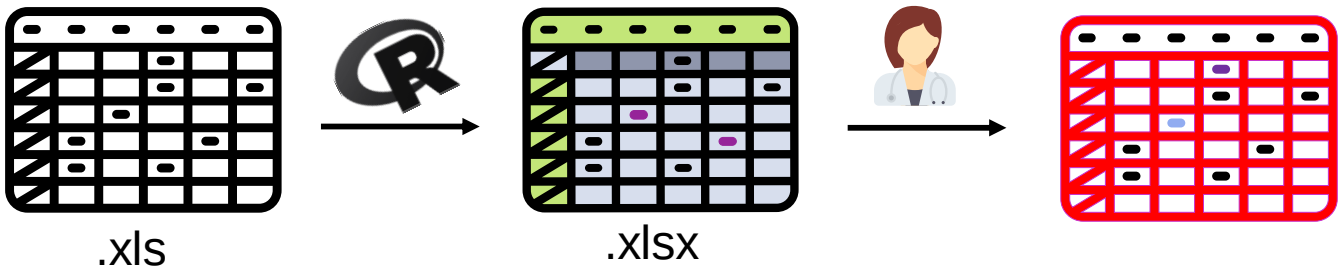


Errores y erratas

Raza	Freq.
Asian oriental	1
Asiático orienta	2
blanco	1
Blanco	2256
Blanco-Asiático oriental	3
Blanco-Negro	6
Asiático del sur	5
Mezcla	15
negro	1
Negro	32
Sudasiatico	1
Sudasiático	3

```
dd1$race <- car::recode(dd1$race, '
 "Mestizo"                          = "Mixed";
 "Blanco-Negro"                     = "Mixed";
 "Blanco-Asiatico oriental"         = "Mixed";
 "Blanco-Sudasiático"               = "Mixed";
 "Sudasiático-Asiático oriental"    = "Mixed";
 "Negro-Asiático oriental"          = "Mixed";
 "Asiático oriental"                = "East Asian";
 "Asiatico oriental"                = "East Asian";
 "Sudasiático"                      = "South Asian";
 "Sudasiatico"                      = "South Asian";
 "negro"                            = "Black";
 "Negro"                            = "Black";
 "blanco"                           = "White";
 "Blanco"                           = "White"
 ')
```

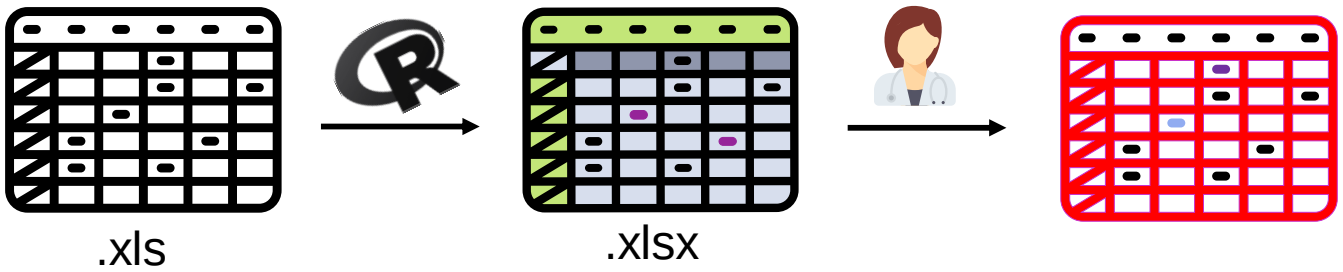
Raza	Freq.
Asian oriental	1
Black	33
East Asian	7
Mixed	6
South Asian	4
White	2257



John Fox and Sanford Weisberg (2019). An {R} Companion to Applied Regression, Third Edition. Thousand Oaks CA: Sage. URL: https://socialsciences.mcmaster.ca/jfox/Books/Companion

Errores y erratas

```
dd1$op <- tolower(dd$op)

dd1$op <- gsub("á", "a", dd1$op); dd1$op <- gsub("é", "e", dd1$op)
dd1$op <- gsub("í", "i", dd1$op); dd1$op <- gsub("ó", "o", dd1$op)
dd1$op <- gsub("ú", "u", dd1$op); dd1$op <- gsub(" ", "",  dd1$op)

dd1$op <- car::recode(dd$op, '
                      “anamaria“   = “Ana María”;
                      “luisacopon” = “Luisa Copón”')
```



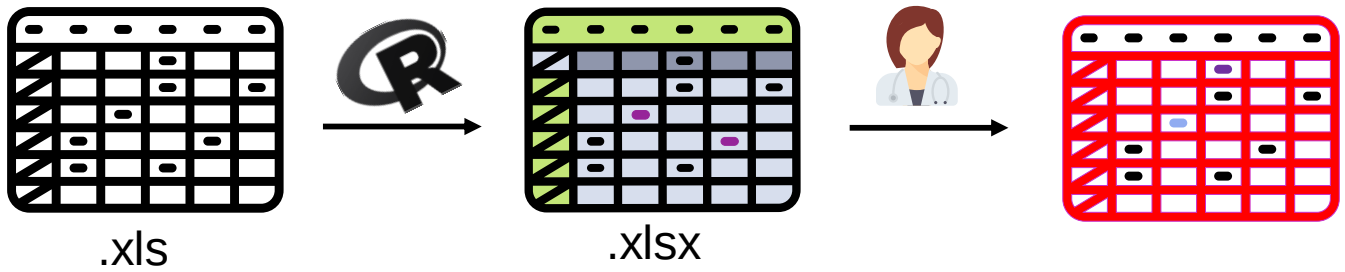
John Fox and Sanford Weisberg (2019). An {R} Companion to Applied Regression, Third Edition. Thousand Oaks CA: Sage. URL: https://socialsciences.mcmaster.ca/jfox/Books/Companion

Fundación iMaterna

Tratamiento de datos

ISPA Instituto de Investigación Sanitaria del Principado de Asturias

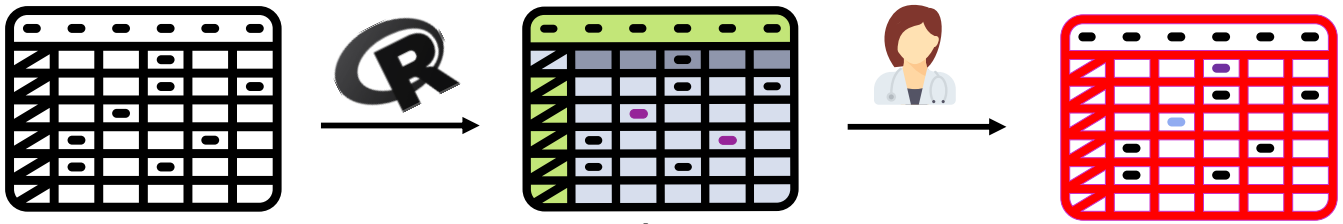
```
dd$m.operator <- gsub("MIR ",   "", dd$m.operator)
dd$m.operator <- gsub("MIR - ", "", dd$m.operator)
dd$m.operator <- gsub(". MIR.", "", dd$m.operator)
dd$m.operator <- gsub(".  MIR", "", dd$m.operator)
dd$m.operator <- gsub(" -MIR-", "", dd$m.operator)
dd$m.operator <- gsub(" _MIR_", "", dd$m.operator)
```



Errores y erratas

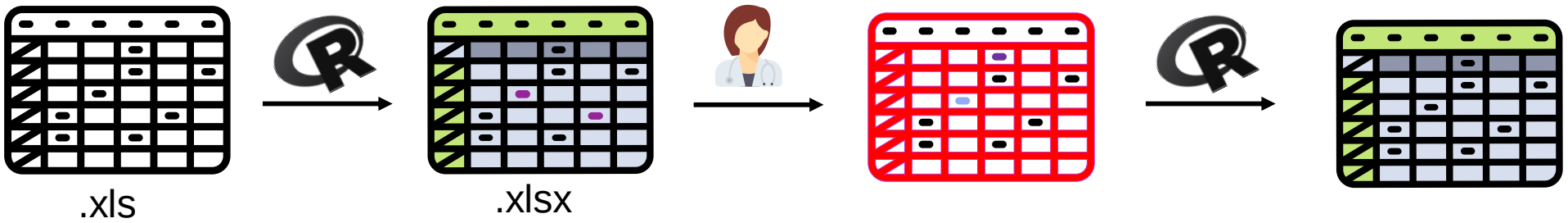
```
dd$m.operator <- gsub("MIR ",   "", dd$m.operator)
dd$m.operator <- gsub("MIR - ", "", dd$m.operator)
dd$m.operator <- gsub(". MIR.", "", dd$m.operator)
dd$m.operator <- gsub(".  MIR", "", dd$m.operator)
dd$m.operator <- gsub(" -MIR-", "", dd$m.operator)
dd$m.operator <- gsub(" _MIR_", "", dd$m.operator)
```

鷬 ú　　袿 ñi
韆 ía　　醬 án
髇 ón　　韓 ín
髏 ós　　韆 ía
髒 á　　醬 án
韌 íg　　閩 ét
醨 ár　　髒 óv



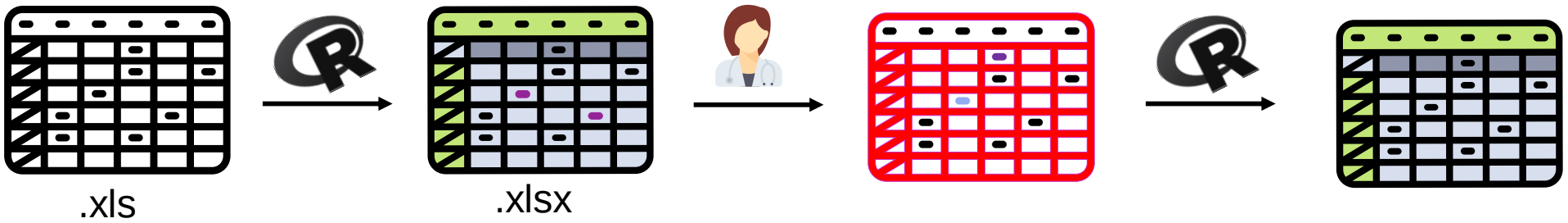
.xls　　.xlsx

Fusión de archivos

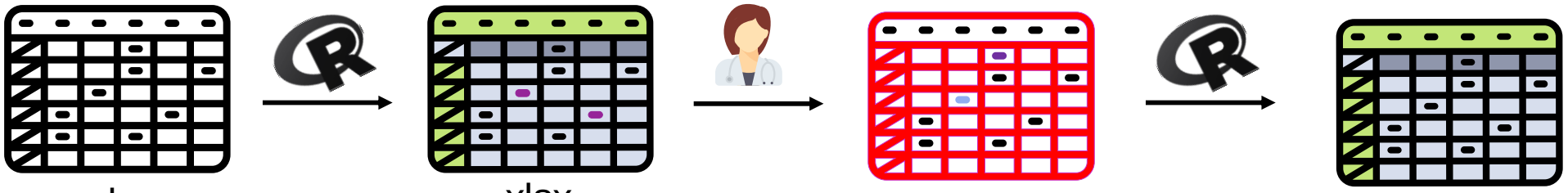


Fusión de archivos

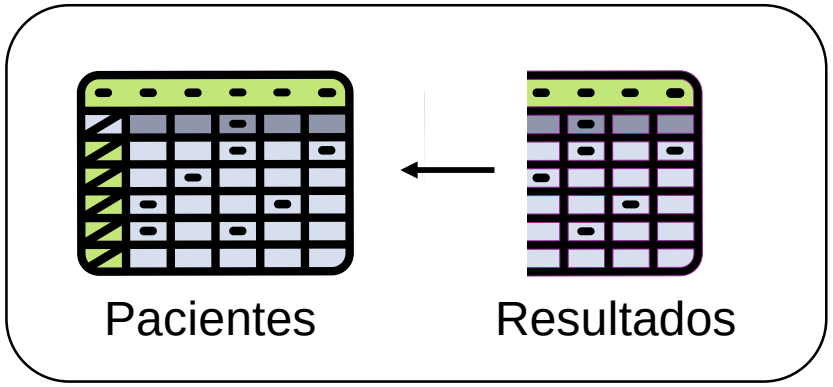
9 meses…

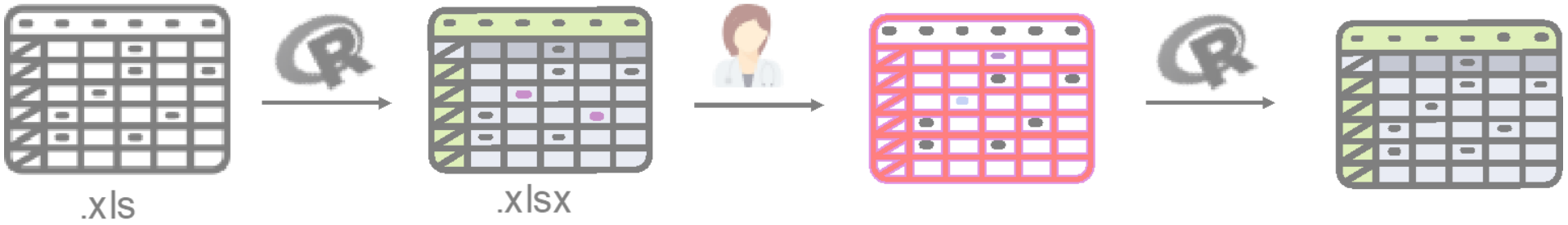


Fusión de archivos

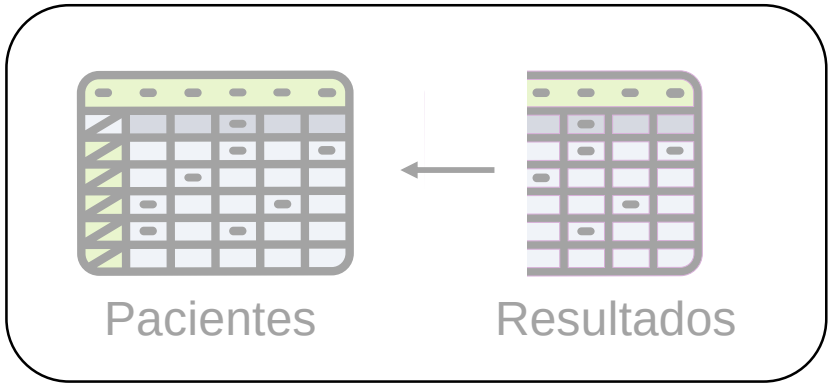


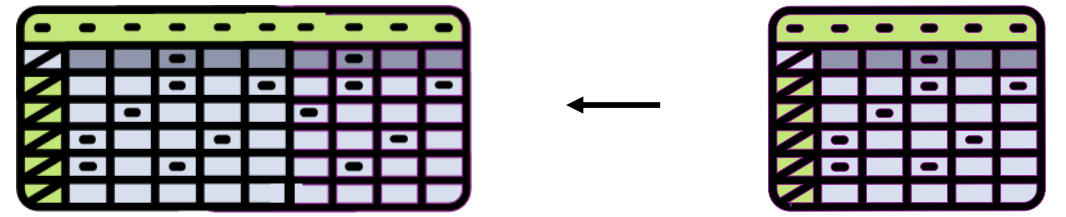
Fusión de archivos

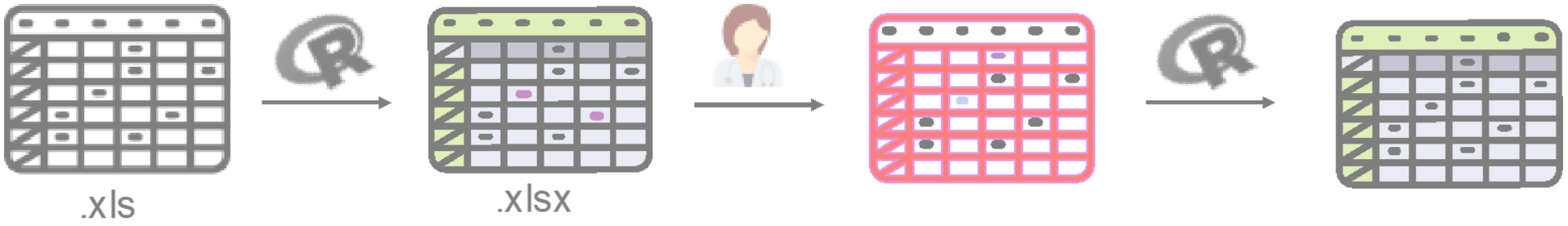




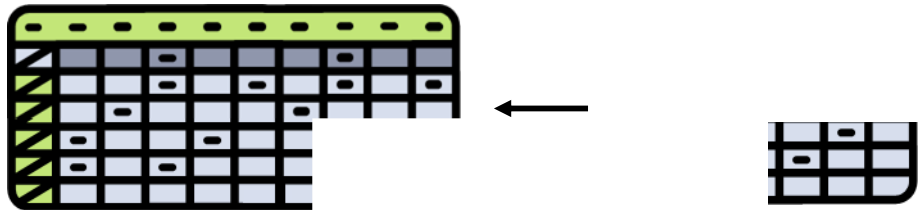
Fusión de archivos





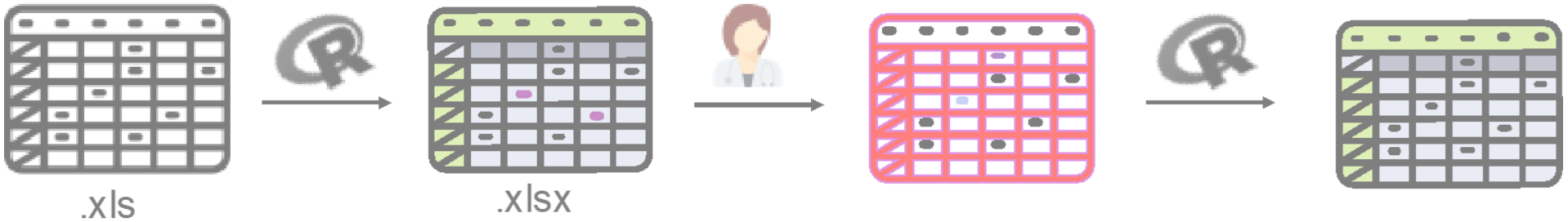


Fusión de archivos



Archivo con resultados

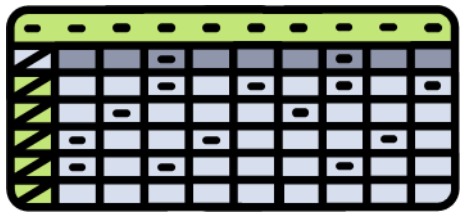
Más resultados y actualizaciones



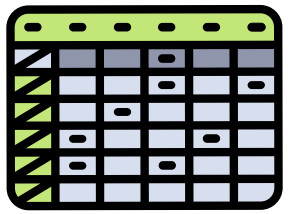
.xls

.xlsx

Fusión de archivos

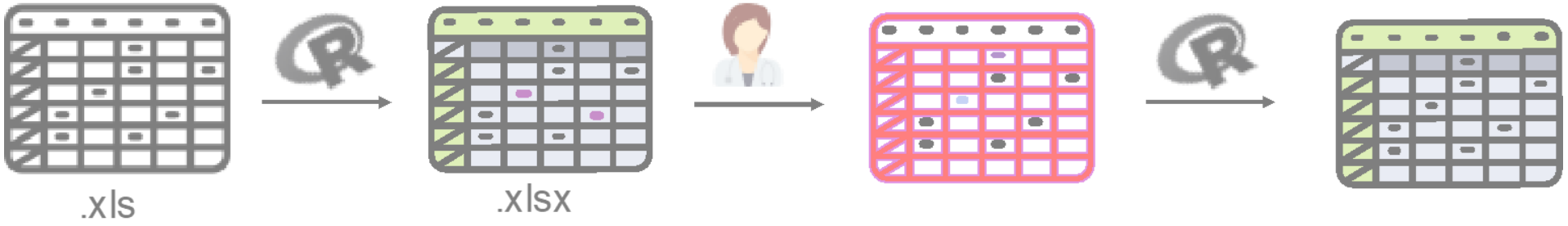


Archivo con resultados

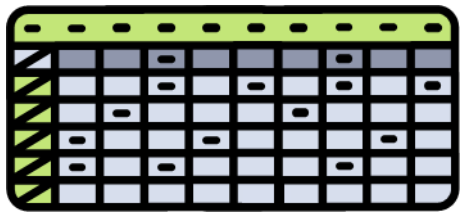


Más resultados y actualizaciones

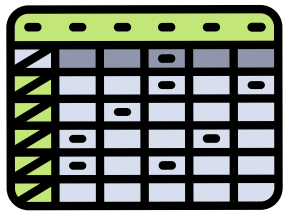
ID	NICU days.x	BW.x	Sex.x	NICU days.y	BW.y	Sex.y
14	0	2610	male	0	2610	male
40	0	342	female	0	**3420**	female
99	1	3040	**female**	1	3040	
102		1200	male	**30**	1200	male
103		3800	male	**2**	3800	male
107	0	2830	female	0	2830	female
141				0	3220	
155				0		male
173				0	3700	male



Fusión de archivos



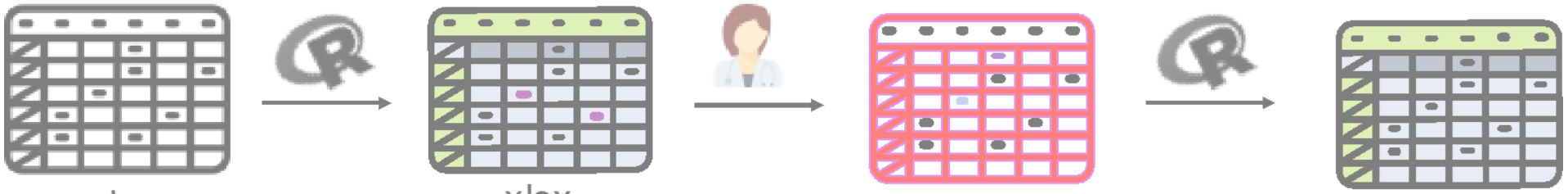
Archivo con resultados



Más resultados y actualizaciones

ID	NICU days.x	BW.x	Sex.x	NICU days.y	BW.y	Sex.y
14	0	2610	male	0	2610	male
40	0	342	female	0	**3420**	female
99	1	3040	**female**	1	3040	
102		1200	male	**30**	1200	male
103		3800	male	**2**	3800	male
107	0	2830	female	0	2830	female
141				0	3220	
155				0		male
173				0	3700	male

`dplyr::coalesce()`

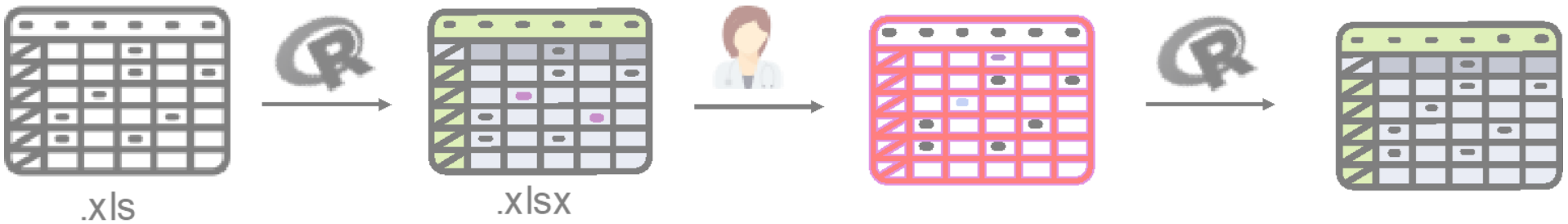


Hadley Wickham, Romain François, Lionel Henry and Kirill Müller (2019). dplyr: A Grammar of Data Manipulation. R package version 0.8.3. https://CRAN.R-project.org/package=dplyr

Fusión de archivos

`dplyr::coalesce()`[1] + bucle o función

`rquery::natural_join()`[2]



[1] *Hadley Wickham, Romain François, Lionel Henry and Kirill Müller (2019). dplyr: A Grammar of Data Manipulation. R package version 0.8.3. https://CRAN.R-project.org/package=dplyr*

[2] *John Mount (2019). rquery: Relational Query Generator for Data Manipulation at Scale. R package version 1.3.9. https://CRAN.R-project.org/package=rquery*

Fundación iMaterna

Fusión de archivos

ISPA Instituto de Investigación Sanitaria del Principado de Asturias

dplyr::coalesce()[1]

```r
coalesce_join <- function(x, y,
                          by = NULL, suffix = c(".x", ".y"),
                          join = dplyr::full_join, ...) {
  joined <- join(x, y, by = by, suffix = suffix, ...)
  # names of desired output
  cols <- union(names(x), names(y))

  to_coalesce <- names(joined)[!names(joined) %in% cols]
  suffix_used <- suffix[ifelse(endsWith(to_coalesce, suffix[1]), 1, 2)]
  # remove suffixes and deduplicate
  to_coalesce <- unique(substr(
    to_coalesce,
    1,
    nchar(to_coalesce) - nchar(suffix_used)
  ))

  coalesced <- purrr::map_dfc(to_coalesce, ~dplyr::coalesce(
    joined[[paste0(.x, suffix[1])]],
    joined[[paste0(.x, suffix[2])]]
  ))
  names(coalesced) <- to_coalesce

  dplyr::bind_cols(joined, coalesced)[cols]
}
```

Edward Visel

https://alistaire.rbind.io/blog/coalescing-joins/

Fusión de archivos

`dplyr::coalesce()`[1]

Merge + conseguir nombres de columnas

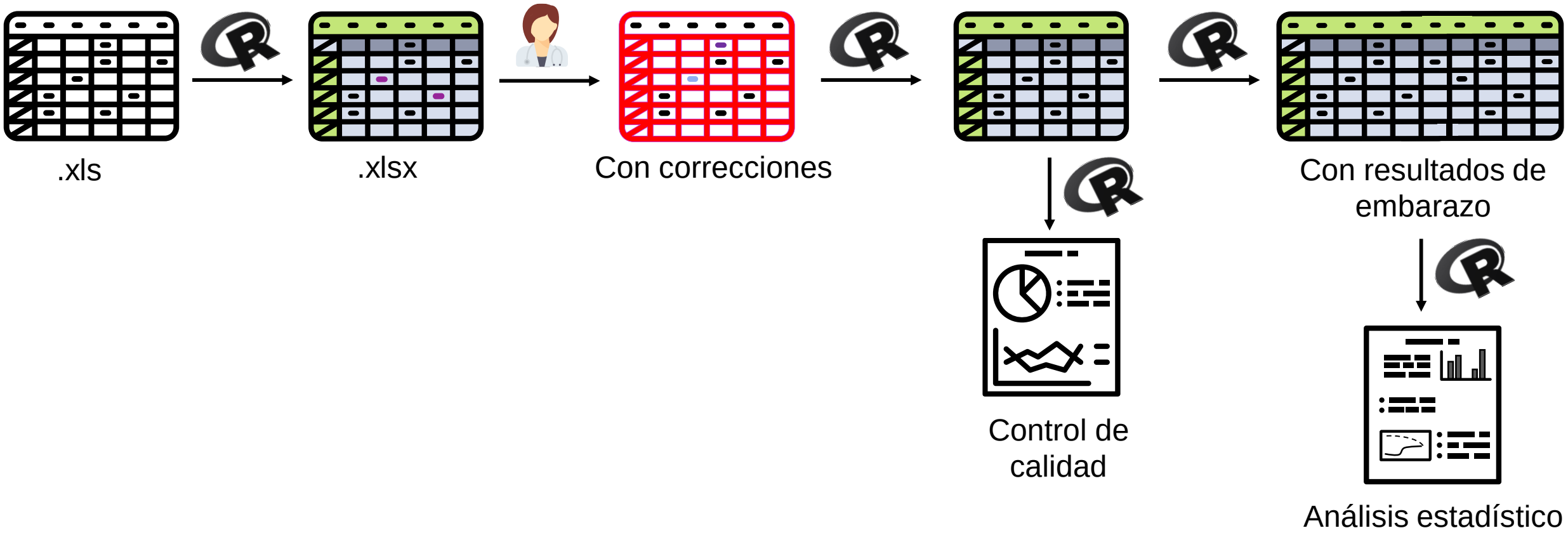
Coalesce de las variables repetidas

```
coalesce_join <- function(x, y,
                          by = NULL, suffix = c(".x", ".y"),
                          join = dplyr::full_join, ...) {
  joined <- join(x, y, by = by, suffix = suffix, ...)
  # names of desired output
  cols <- union(names(x), names(y))

  to_coalesce <- names(joined)[!names(joined) %in% cols]
  suffix_used <- suffix[ifelse(endsWith(to_coalesce, suffix[1]), 1, 2)]
  # remove suffixes and deduplicate
  to_coalesce <- unique(substr(
    to_coalesce,
    1,
    nchar(to_coalesce) - nchar(suffix_used)
  ))

  coalesced <- purrr::map_dfc(to_coalesce, ~dplyr::coalesce(
    joined[[paste0(.x, suffix[1])]],
    joined[[paste0(.x, suffix[2])]]
  ))
  names(coalesced) <- to_coalesce

  dplyr::bind_cols(joined, coalesced)[cols]
}
```

Edward Visel

https://alistaire.rbind.io/blog/coalescing-joins/

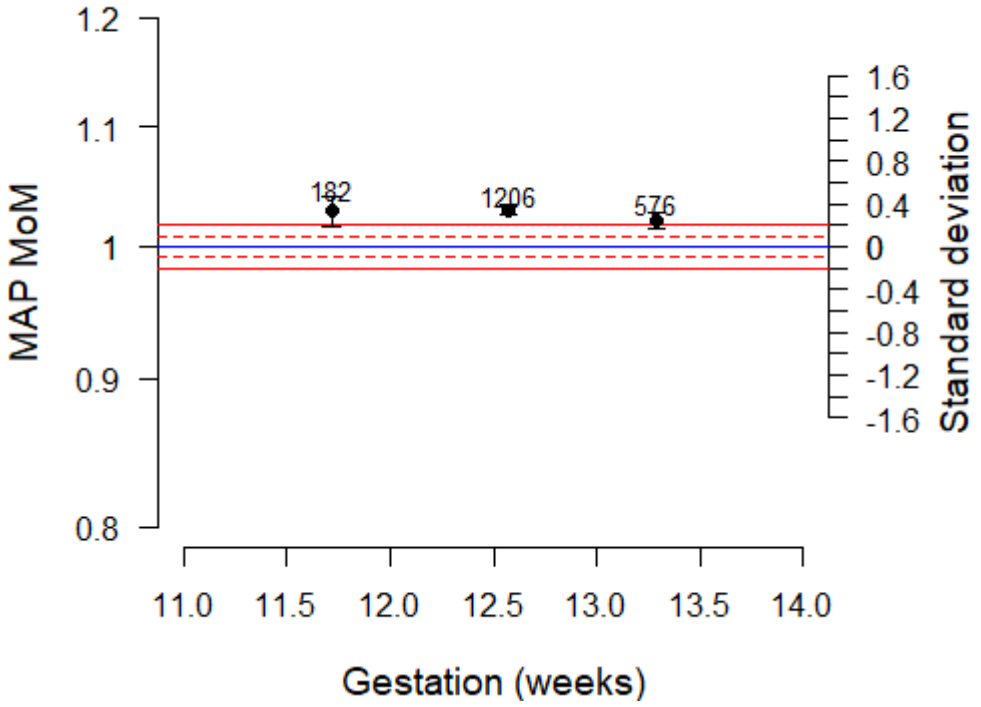
Fusión de archivos

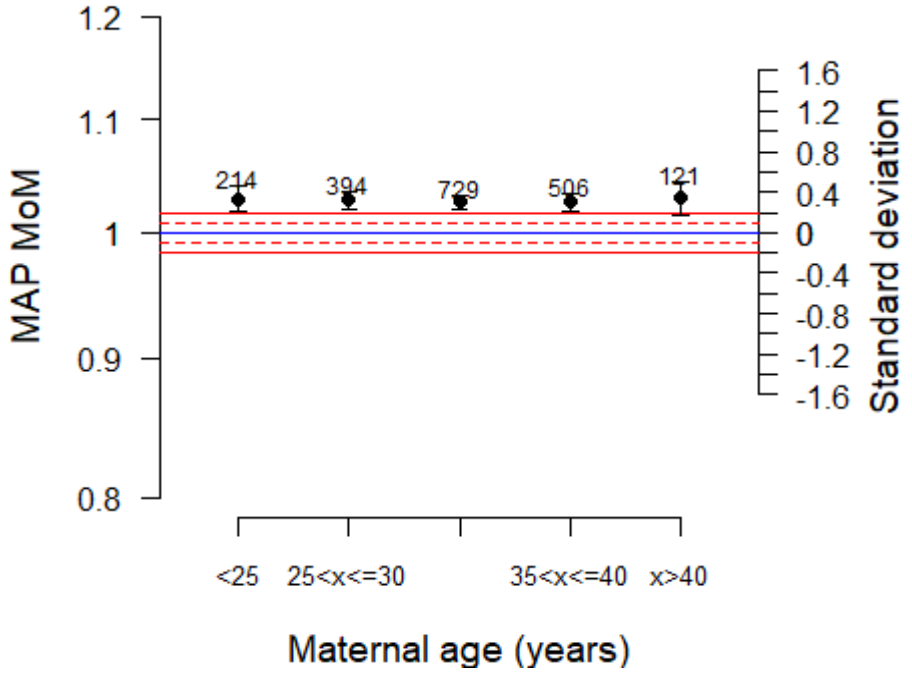


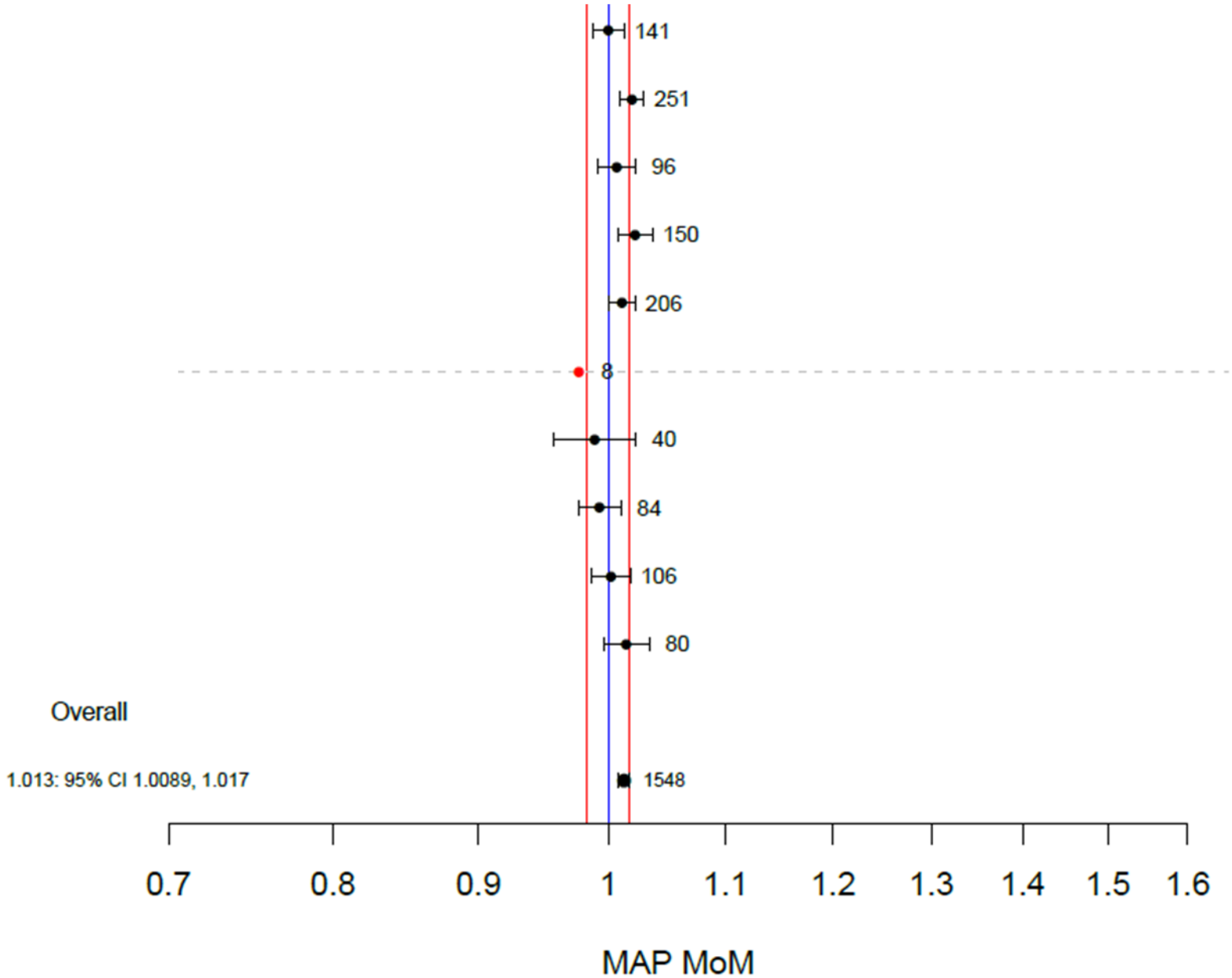
Fundación iMaterna

Gráficos

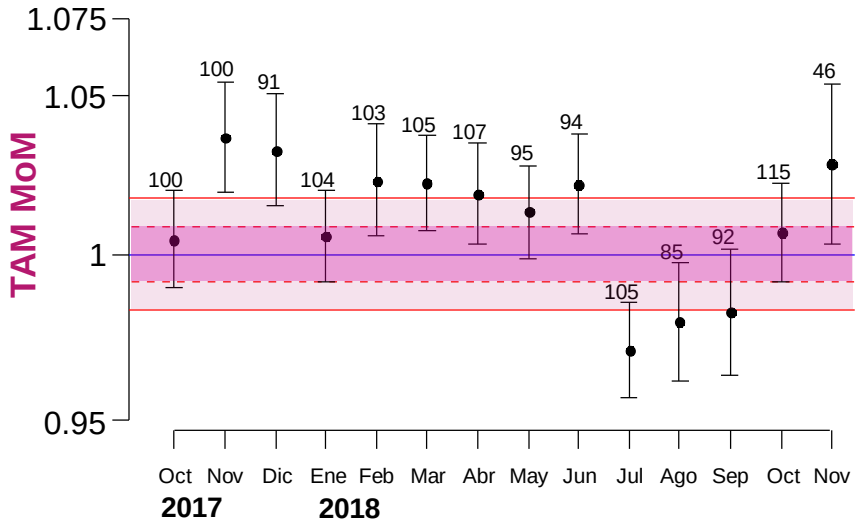
ISPA Instituto de Investigación Sanitaria del Principado de Asturias

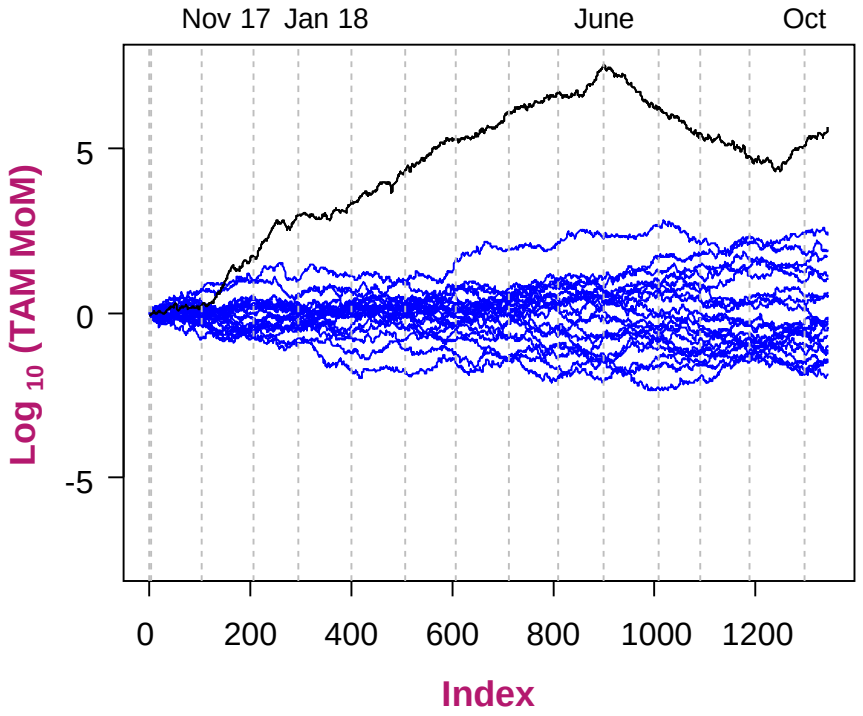





141
251
96
150
206
8
40
84
106
80
Overall
1.013: 95% CI 1.0089, 1.017
1548
0.7
0.8
0.9
1
1.1
1.2
1.3
1.4
1.5
1.6
MAP MoM

Fundación iMaterna





Conclusiones

- Son necesarias auditorías periódicas y frecuentes.
- La auditoría de parámetros es efectiva en corregir desviaciones.
- R es una herramienta apropiada y eficaz para consolidar datos.

Agradecimientos
- Alan y David Wright por apoyo estadístico
- Thermo Fisher por suministro de reactivos de PlGF
- Viewpoint y HNC por suministro del software

Gracias