



# Value of occupational health and safety data collection

Zodwa Ndlovu



UNIVERSITY OF THE  
WITWATERSRAND,  
JOHANNESBURG

**WITS School of  
Public Health**

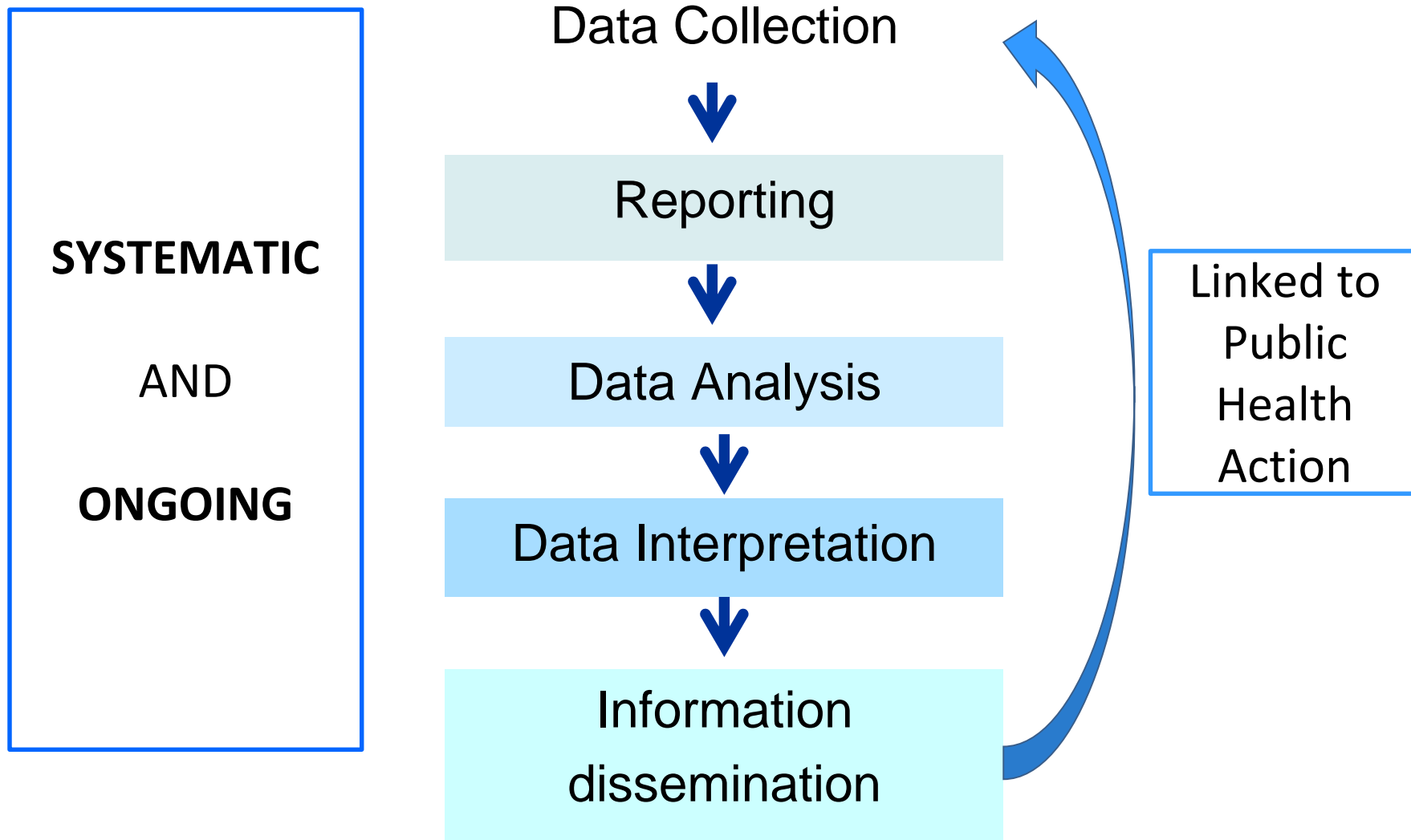
## Summary

*“A major difficulty in assessing incidence and prevalence of occupational diseases among the workforce employed in South African mines is the lack of epidemiological data.....*

*...Recommendations for **improved data reporting** and research are made, in particular **the need to identify occupational groups at high risk** and the calculation of prevalences.”*

Leger JP. 1992. Occupational diseases in South African mines-a neglected epidemic? S Afr Med J 81: 197-201.

# Surveillance: Information for **ACTION**



# Occupational health surveillance

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- **Hazard surveillance** identifies workers or work areas with excessive **exposures** who therefore have the potential to develop disease (leading indicators). Interventions can then be put in place to reduce hazardous workplace exposures and thereby reduces disease risk
- **Occupational health surveillance** is the systematic investigation of the occurrence of **health outcomes** in relation to work conditions in worker populations

**Medical surveillance** (medical screening): testing of individual workers for early disease detection and prevention at the individual level

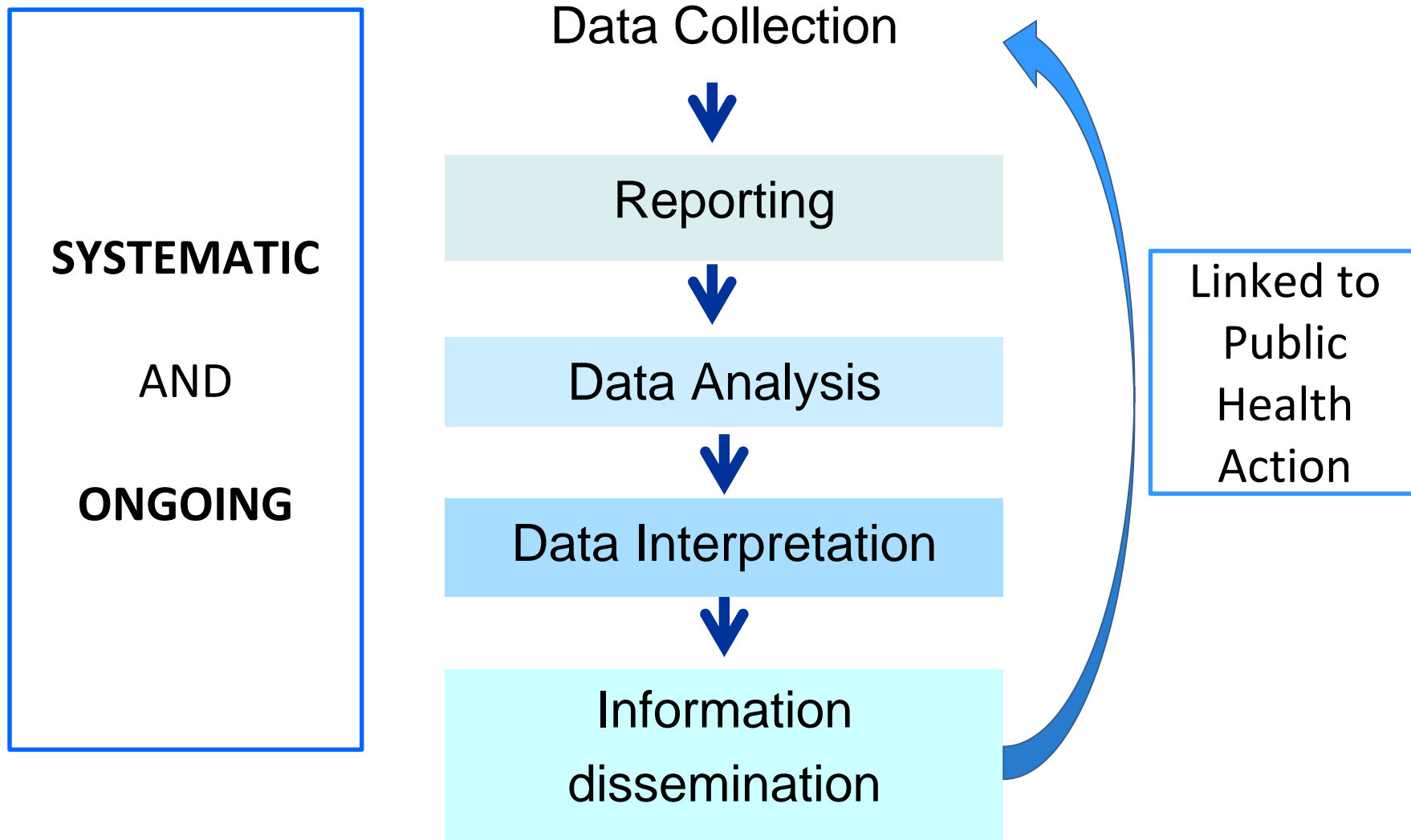
# Value of data collection and surveillance

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- Detect disease, injuries, exposures
- Estimate magnitude
- Detect trends
- Identify of risk factors
- Identify new/emerging concerns (sentinel cases)
- Stimulate research leading to prevention and control
- Provide evidence for planning, policy of improved practice
- Monitor of effectiveness of interventions

CDC (2001). Updated Guidelines for Evaluating Public Health Surveillance Systems, CDC, Atlanta.

# Surveillance: Information for **ACTION**



# Data collection

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Population- or industry- based

Physician reporting

Routine, administrative data

- household surveys

- death certification

- cancer registries

- hospital discharge records

- workers compensation systems

- In SA – annual reports of the MBOD, NIOH, RMA, DMR, mining corporations etc.

# Data collection, analysis & interpretation

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What to collect?

**Outcome** - disease, injury, exposure, date of diagnosis etc.

**Personal information** – age, sex, race etc.

**Employment information** – employer, industry type, job category etc.

**Denominator information**, if available



# Value of data collection and surveillance

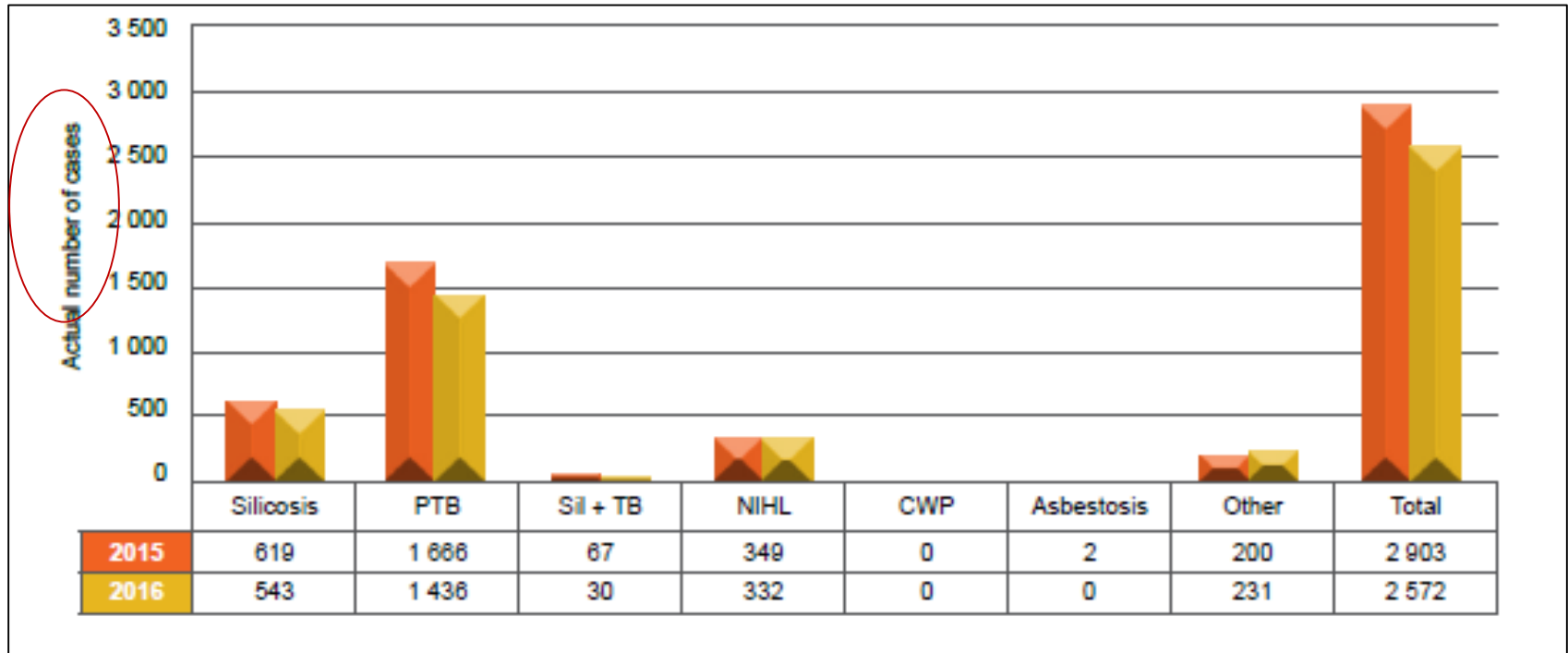
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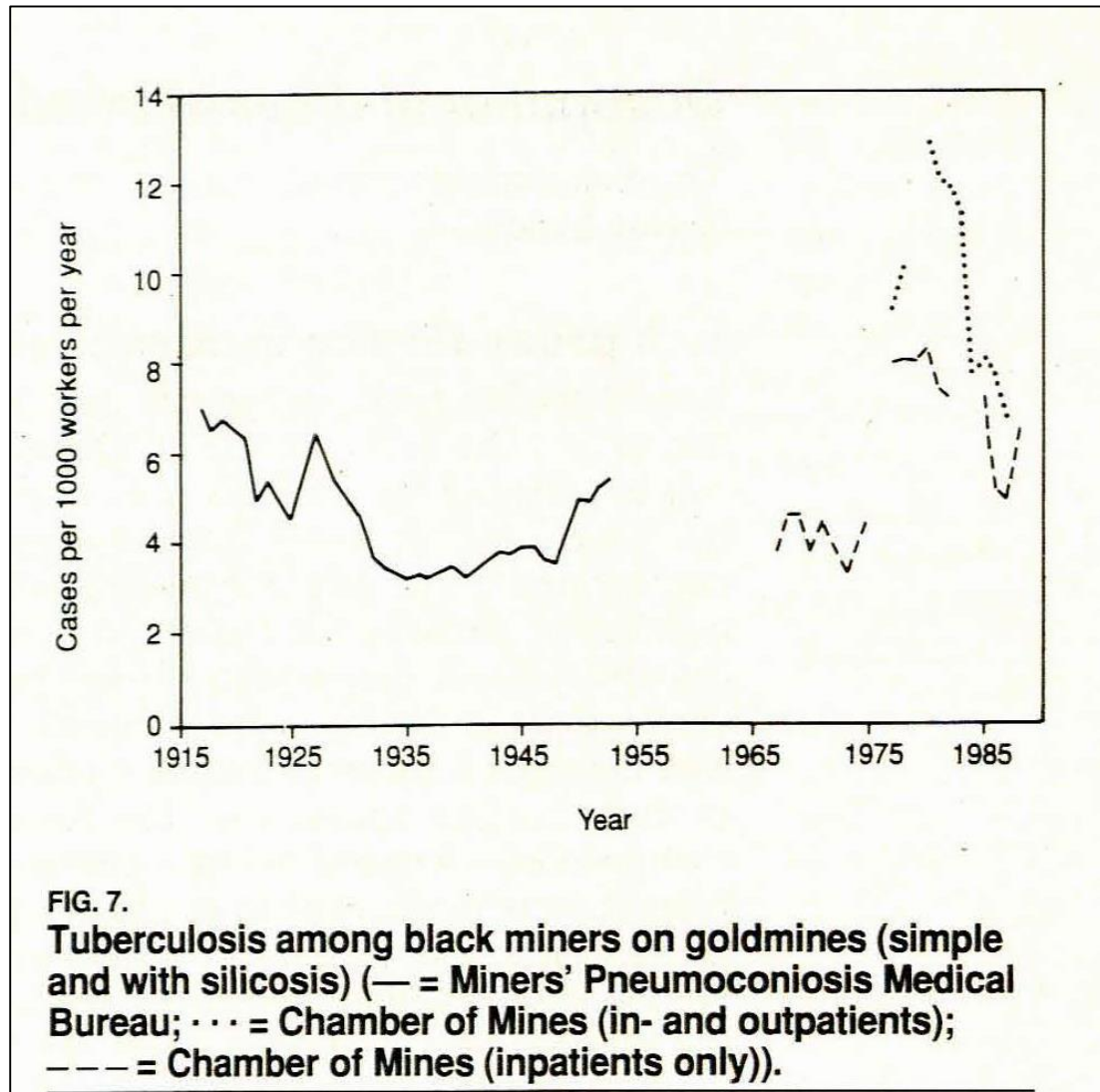
# Magnitude

## Occupational diseases reported from gold mines: 2015- 2016



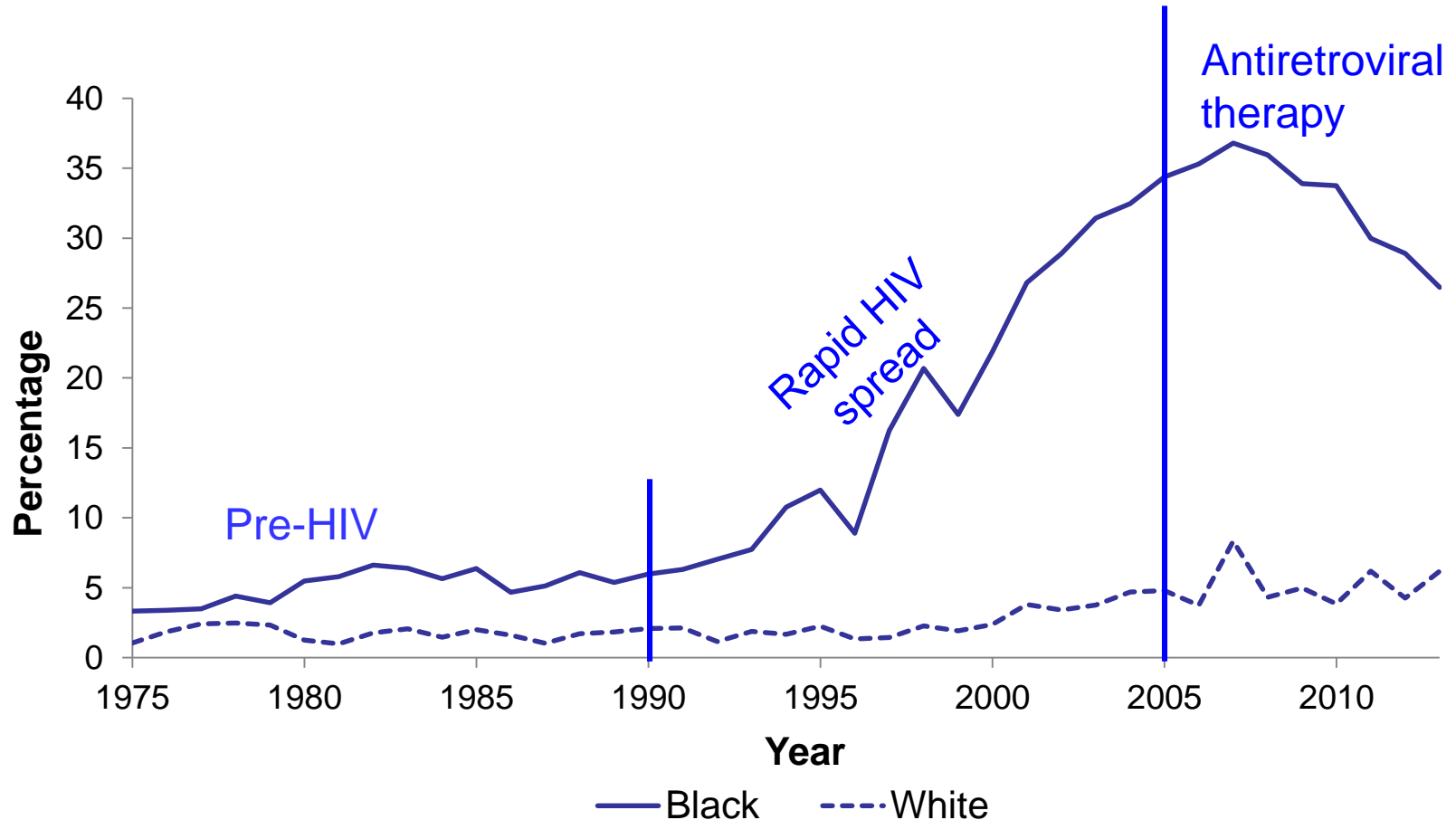
MHSI. 2018. Mine Health and Safety Annual Report, 2016/2017. Department of Mineral Resources, South Africa.

# Magnitude and trends



# Magnitude and trends

Crude trends of autopsy diagnosed PTB, 1975-2014



Ndlovu et al. Four decades of pulmonary tuberculosis in deceased South African miners: trends and determinants. *Occupational and Environmental Medicine*, 2018; 75(11):767-75.

# Risk factors: Determinants of PTB by calendar period

VARIABLE	BLACK				WHITE			
		1975-89	1990-04	2005-14		1975-89	1990-04	2005-14
Year of autopsy	1975-1979	Ref	Ref	Ref	1975-79	Ref	Ref	Ref
	1980-1984	<b>1.31</b>			1980-84	0.84		
	1985-1989	1.09			1985-89	1.02		
	1990-1994		<b>1.62</b>		1990-94		1.12	
	1995-1999		<b>2.71</b>		1995-99		1.03	
	2000-2004		<b>5.95</b>		2000-04		<b>1.87</b>	
	2005-2009			<b>9.79</b>	2005-09			<b>2.74</b>
	2010-2014			<b>7.78</b>	2010-14			<b>2.46</b>
Age (years)	<30	Ref	Ref	Ref	<50	Ref	Ref	Ref
	30-39	<b>1.33</b>	<b>1.40</b>	<b>1.33</b>	50-59	1.02	<b>1.26</b>	0.98
	40-49	<b>1.81</b>	<b>1.58</b>	<b>1.30</b>	60-69	1.30	0.69	0.76
	50-59	<b>2.24</b>	<b>1.44</b>	1.00	≥70	1.40	0.85	0.53
	≥60	<b>2.47</b>	<b>1.39</b>	<b>0.65</b>				
Gold employment (years)	0	Ref	Ref	Ref	0	Ref	Ref	Ref
	<10	1.05	0.97	<b>1.13</b>	<10	1.22	1.30	1.03
	10-19	1.10	1.00	<b>1.46</b>	10-19	<b>1.67</b>	1.10	1.18
	≥20	1.05	0.99	<b>1.43</b>	20-29	<b>1.88</b>	1.18	1.22
					≥30	1.39	0.89	0.96
Silicosis	Absent	Ref	Ref	Ref	Absent	Ref	Ref	Ref
	Present	<b>3.08</b>	<b>1.54</b>	<b>1.34</b>	Present	<b>2.21</b>	<b>3.15</b>	<b>3.59</b>
HIV	Absent		Ref	Ref	Absent		Ref	Ref
	Present		<b>1.37</b>	<b>1.17</b>	Present		<b>1.83</b>	<b>2.53</b>

# Sentinel cases

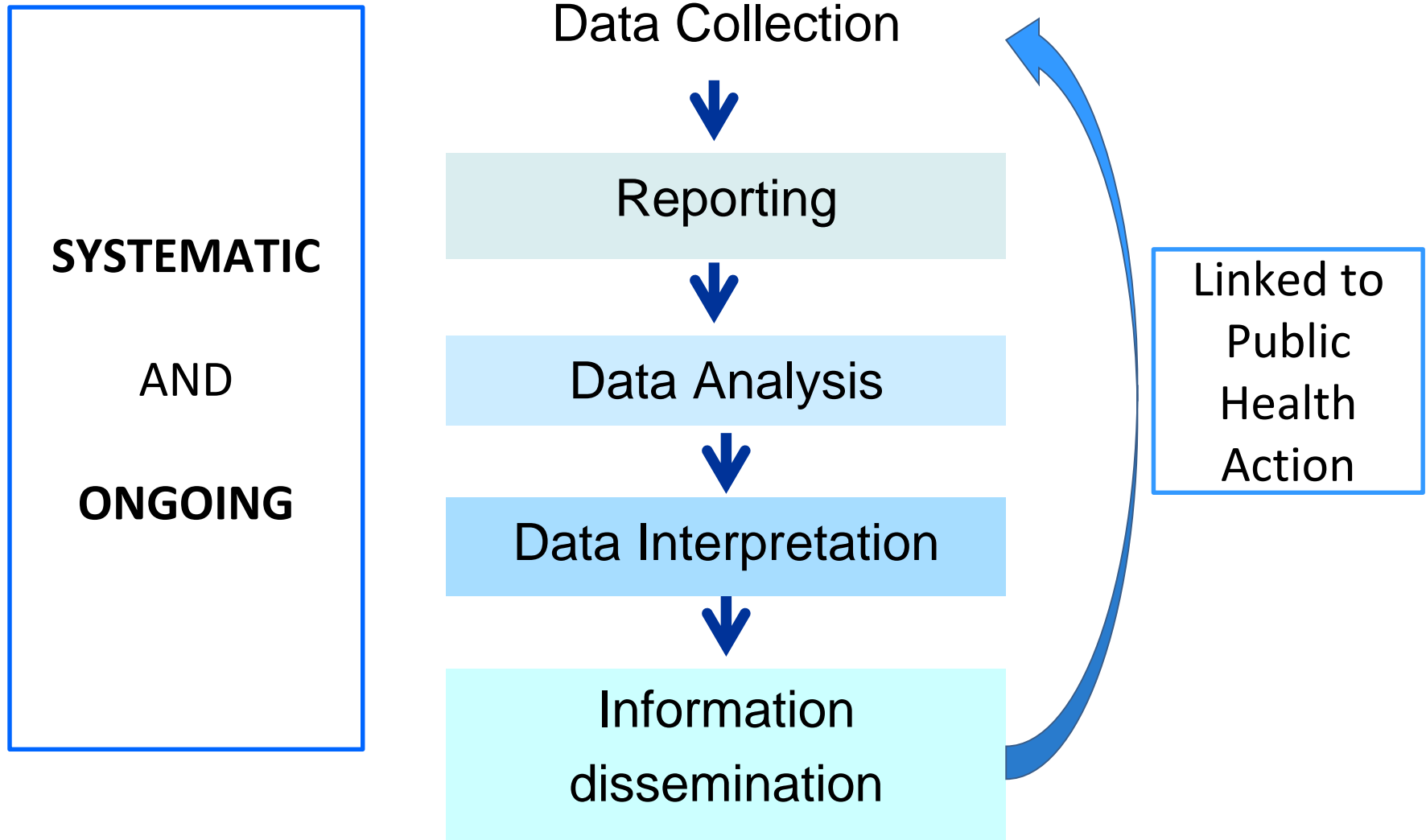
Case series: 68 female and 779 male gold miners autopsied 2005-2015 and started work after 2002.

Autopsy diagnosis of silicosis

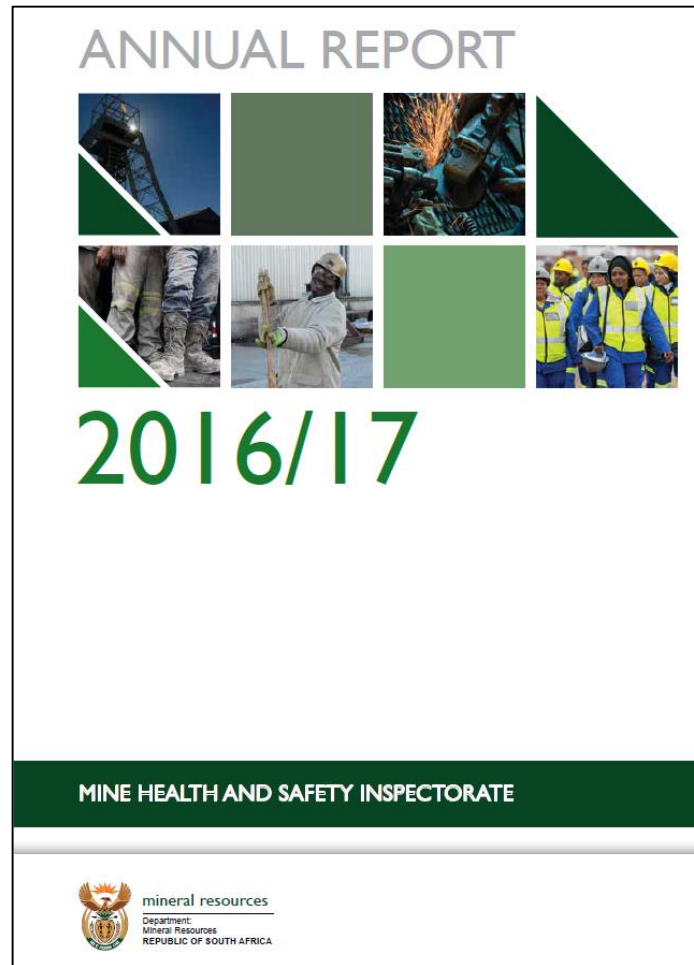
Died	Age at employment	Age at death	Years employed	Years worked	Occupation	Dust	Silicosis
2009	23	26	2006-09	3.3	Miner	High	Mild
2010	32	35	2006-10	3.8	Miner	High	Mild
2014	36	47	2003-12 2013-14	10 1	Winch driver Belt attendant	Low High	Mild

Ndlovu N, Richards G, Vorajee N, Murray J. Silicosis and pulmonary tuberculosis in female South African miners. *Occupational Medicine, (Lond)*, 69, 272-278.

# Surveillance: Information for **ACTION**



# Dissemination of information





# Occupational Health Southern Africa

- The only occupational health journal in southern Africa
- 1 Editor-in-Chief, 1 Assistant Editor, 8 Editorial Board members representing 4 occupational health societies (SASOM, SAIOH, SASOHN and MMPA)
- Published bi-monthly (6 issues per year)
- Mission:
- to keep occupational health practitioners (doctors, nurses, hygienists and others) informed about current local research, views of experts, and developments in occupational health (including occupational medicine and occupational hygiene)
- to provide a publishing platform for both novice and experienced researchers in the region



occupational  
health  
SOUTHERN AFRICA

## Papers published by Society members, (2017 - 2018)

Society	2017		2018		2019*	
	n	%	n	%	n	%
SASOHN	1	4	0	-	4	27
SASOM	7	28	3	18	1	7
SAIOH	5	20	1	5	3	20
MMPA	2	8	3	18	0	0
Non-society	10	40	12	63	7	47
Total	25		19		15	

# CONCLUSION

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## Limitations

No suitable denominators to calculate incidence/prevalence –  
use proportions

Exclusion of former black miners

## Strengths

Legislative framework





# Characteristics of the study population, 1975-2014

Characteristic	Black N=53248	White N=30724	p-value
Age (years), mean $\pm$ SD	39.73 $\pm$ 11.27	61.70 $\pm$ 13.98	<0.0001
Employment duration (years), mean $\pm$ SD	10.51 $\pm$ 8.11	24.95 $\pm$ 8.90	<0.0001
Employment status, n (%)			
Current miner	5,385 (79.20)	473 (13.07)	<0.0001
Former miner	1,414 (20.80)	3,147 (86.93)	
Commodity, n (%)			
Gold	41,308 (77.58)	24,170 (78.67)	<0.0001
Platinum	6,369 (11.96)	1,087 (3.54)	
Coal	3,414 (6.41)	1,945 (6.33)	
Asbestos	1,178 (2.21)	741 (2.41)	
Other	979 (1.84)	2,781 (9.05)	