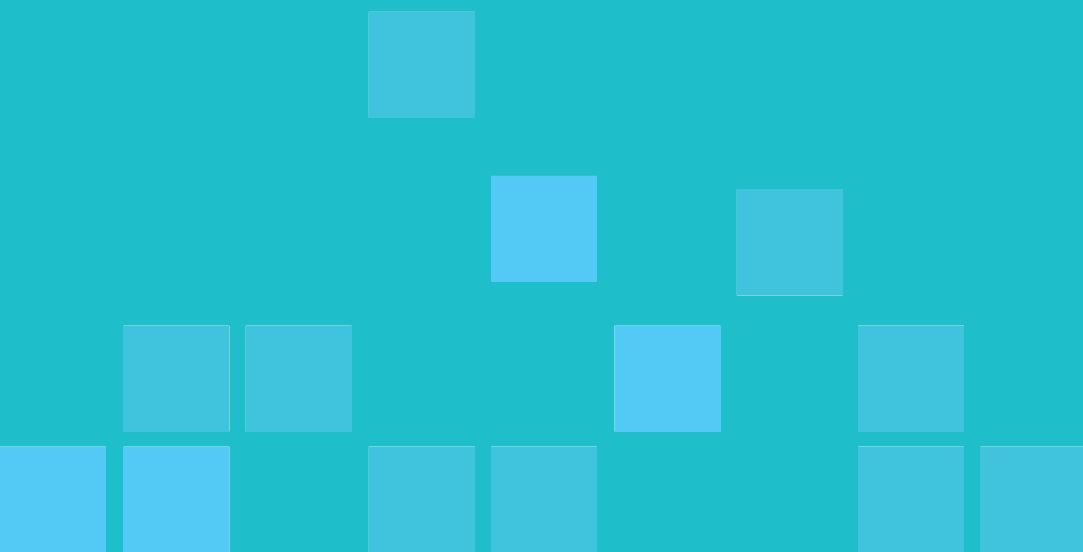




**‘METICILLIN-RESISTANT STAPHYLOCOCCUS
AUREUS (MRSA) IN IRELAND:
ADDRESSING THE ISSUES’**



Pfizer provided an unrestricted educational grant to develop and publish this report.

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Introduction

In Ireland over the last 10 years, there has been a significant degree of media attention and political focus on healthcare-associated infection (HCAI) in general and meticillin resistant *Staphylococcus aureus* (MRSA) in particular. In 2000, the Department of Health and Children requested the then National Disease Surveillance Centre to make recommendations for the prevention of antimicrobial resistance and the Strategy for the Control of Antimicrobial Resistance in Ireland (SARI) was published in 2001. Since then, further national and international guidance on the prevention and management of HCAI and MRSA has become available.

This report aims to provide an accessible summary of the current position on MRSA, particularly where it pertains to Ireland. The document has been developed to examine broader issues in relation to the management of MRSA which may be of use to healthcare managers and administrators, policy makers, politicians, journalists, the pharmaceutical industry, medical insurers, hospital managers, the legal profession, patient advocacy groups and patients with MRSA and their families.

The report has been produced by the members of a multi-disciplinary expert group including microbiologists, hospital pharmacists and patient advocates.

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Helpful feedback has been received from representative organisations for key health professionals.

Pfizer has provided an unrestricted educational grant to develop and publish this report.



1 The facts about MRSA

1.1 MSSA and MRSA

Bacteria are present in the nose and on the skin of healthy individuals, they are said to colonise these sites and are referred to as normal flora. The bacteria present are mainly beneficial, but in certain circumstances they may be associated with infection. In about one third of healthy people, the normal flora includes *Staphylococcus aureus* (*S. aureus*).

If *S. aureus* gains entry through a break in the skin, it can cause minor skin infections such as boils and abscesses. Although it can also cause more severe disease such as life-threatening bloodstream infection (BSI) and infective endocarditis (infection of the lining of the heart), this is uncommon. In general *S. aureus* is sensitive to many first-line antibiotics and infections are generally treated with penicillins and cephalosporins, which act in a similar way against *S. aureus*. Penicillins include meticillin, cloxacillin and flucloxacillin and cephalosporins include cephadrine and cefuroxime. Meticillin was the first of these agents used in clinical practice and by convention the term is used when referring to resistance to these antibiotics. *S. aureus* which remain sensitive to these agents are generally referred to as meticillin-sensitive *S. aureus* or MSSA. Resistant strains of *S. aureus* are designated meticillin-resistant *Staphylococcus aureus* or MRSA.

MRSA was first reported internationally in 1961 and recognised as a problem in Irish hospitals in the 1980s. MRSA may be found in about 3% of the general population. It normally colonises the same sites (nose and skin folds) as MSSA. As with MSSA, most patients colonised with MRSA are not infected, although infection with MRSA can develop in some patients.

Treatment of infection due to MRSA is more complex than treatment of MSSA infection. It can be more difficult to choose the most appropriate antibiotic treatment at the outset (before it is known that the infection is caused by MRSA) and the range of effective antibiotics available to treat MRSA infection is more limited. In general the outcome of serious infection with MRSA tends to be less favourable. This may be related at least in part to the complexity of treatment but the outcome also relates to the general health of the patient and to variations in the virulence (ability to cause serious disease) of different strains of *S. aureus*.

The most common strains of MRSA are healthcare-associated are typically seen in hospitalised patients or in those receiving treatment in other healthcare facilities such as day units and nursing homes. In recent years, a novel strain of MRSA, designated community-acquired MRSA has been recognised and can spread readily from person to person, often in the community setting. It has been found in many countries, including Ireland and can cause severe infection in otherwise healthy individuals.

1.2 Healthcare-associated infection

Healthcare-associated infection (HCAI) refers to infection, which is usually acquired 48 hours or more after admission to hospital or after contact with a healthcare facility, such as a day care unit or a nursing home, etc.^{1,2}

HCAI can be caused by both antibiotic-susceptible and antibiotic-resistant bacteria, which can arise from the patients' own flora (endogenous) or can be acquired from other patients, the hands of healthcare workers or from the healthcare environment (exogenous). *S. aureus* (including MRSA) is a common cause of HCAI, but many other bacteria such as *Escherichia coli*, *Clostridium difficile*, *Pseudomonas aeruginosa* etc. and viruses such as that which causes winter vomiting disease can also lead to HCAI.

There are both patient and non-patient factors which predispose to acquisition of HCAI. Patient factors include extremes of age, surgical and other wounds, the presence of medical devices such as catheters and drains, severity of illness, co-morbidities, length of hospital stay and recent surgery or ICU care. Hospital factors include poor hand-hygiene compliance, widespread use of antimicrobials, contaminated equipment, a poorly maintained hospital environment, delay in patient isolation, low staff-patient ratios and the inadequacy of both the hospital infrastructure and isolation facilities.

Infections are categorised according to the site of the infection, e.g. lungs, urinary tract, skin, bloodstream and by the causative organism. Urinary tract infection (UTI) is the most common HCAI, whereas bloodstream infection (BSI) is less common but has the highest mortality.³ *S. aureus* BSI can lead to deep-seated infection involving the heart and lungs, the kidneys, the spine and the liver and can be life-threatening. Figure 1 shows the sites most susceptible to infection and where possible, defines the portal of entry for many of these infections.

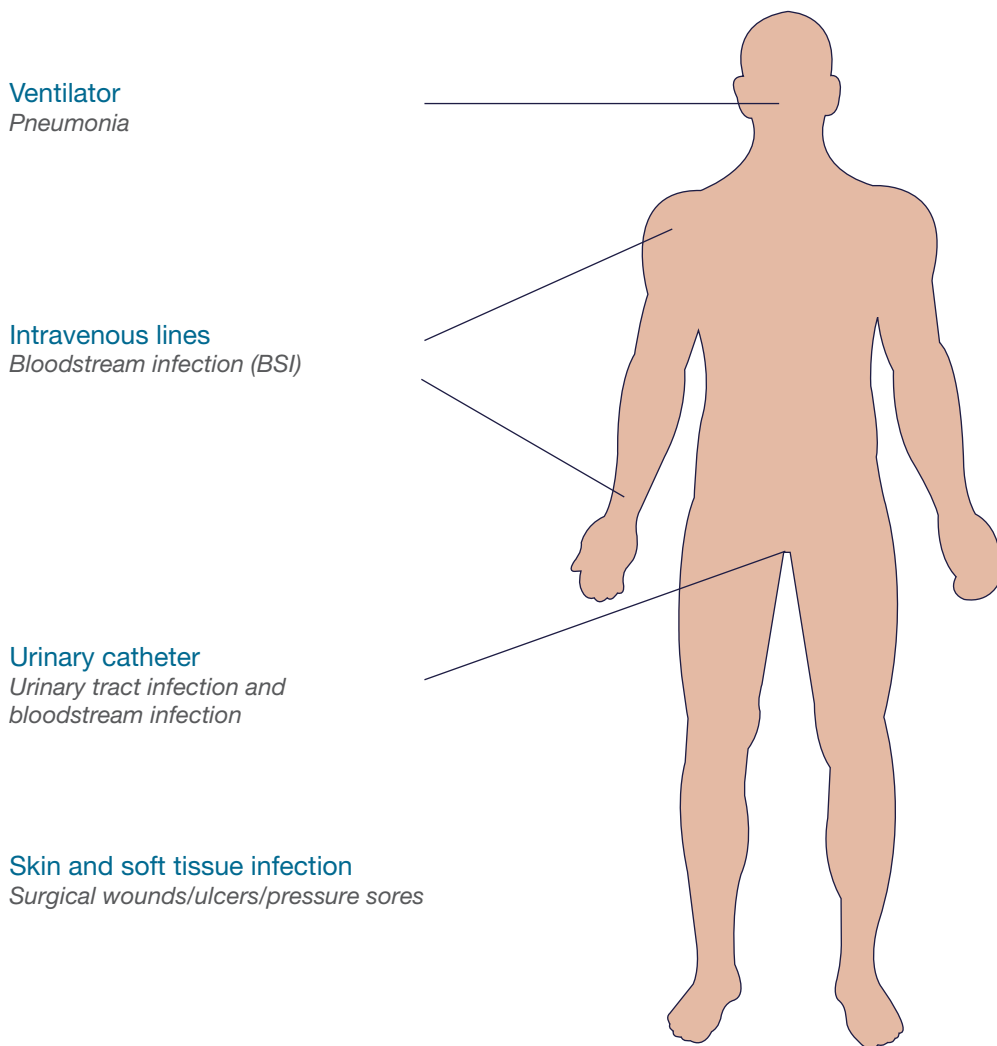


1.3 The risk of acquiring MRSA

Hospitalised patients are most at risk of acquiring MRSA; most of these patients are colonised rather than infected. The commonest colonisation sites are the nose, groin and areas of broken/injured skin such as wounds and ulcers. In many cases colonisation does not progress to infection, but in a subset of patients, infection does supervene and this ranges from mild skin and soft-tissue infection to life-threatening invasive infection. The factors which influence this are not fully understood but include patient susceptibility and variations in the virulence of individual strains of MRSA. Patient risk factors associated with infection include underlying illness (such as cancer or major trauma) and certain treatments such as central venous lines and anti-cancer drugs.

Healthy individuals such as healthcare workers, patients' families and household contacts of those discharged from hospital with MRSA are at very low risk of developing MRSA infection.

Figure 1: Routes and Sites of MRSA Infection





The HSE Infection Control Action Plan estimates that 25,000 in-patients develop HCAI annually in Ireland.



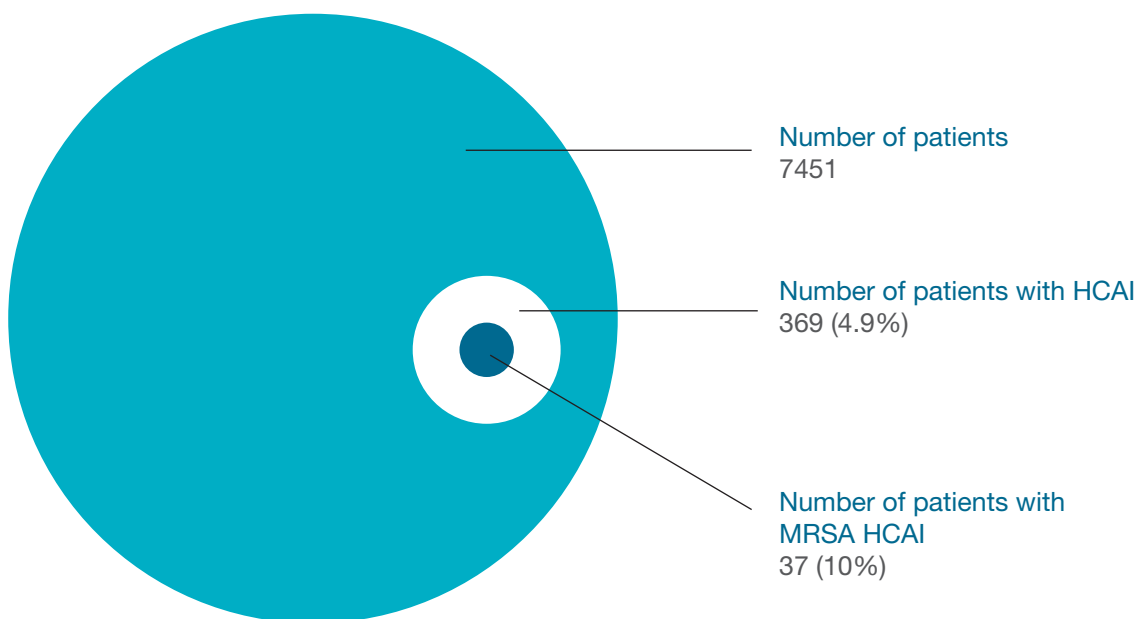
2 The scale of the problem with MRSA in Ireland

2.1 HCAI and MRSA infection rates

A point prevalence study carried out in 2006 by the Hospital Infection Society (HIS) examined the frequency of HCAI, including HCAI due to MRSA, on a given day in Ireland, England, Wales and Scotland.⁴ The total number of patients surveyed in the Republic of Ireland (ROI) was 7,541, of which 369 had HCAI and 37 of these were due to MRSA.

These figures indicate a HCAI prevalence of 4.9% in Ireland, the lowest among the four countries, which ranged from 4.9% to 8.1%.

Figure 2: 2006 HIS Study, HCAI and MRSA point prevalence in ROI



In interpreting this data, it is important to consider possible factors that might explain the apparent relatively low prevalence of HCAI in Ireland. The Irish survey included more small hospitals with low-risk patients, perhaps reflecting differences in healthcare provision. Countries like the US and Australia may also have different ways of calculating rates of HCAI, so data should be compared cautiously.

Based on a 4.9% HCAI prevalence, the Health Service Executive (HSE) Infection Control Action Plan estimated that in the order of 25,000 in-patients may develop HCAI each year.⁵ This figure of 25,000 may well be an underestimate of the number of HCAI for the following reasons:

- estimation of incidence (number of cases that occur over a period of time) from prevalence (the number of cases present at a specific time point) data has many limitations
- only HCAI acquired in the reporting hospital was included
- only HCAI which met CDC surveillance definitions was included
- only hospitals with infection control teams participated

2.2 MRSA surveillance in intensive care units (ICUs) in Ireland

Weekly prevalence surveillance of MRSA in Irish ICUs during 2008 reveals that the proportion of ICU patients colonised with MRSA ranges from 2.9% to 21.2%.⁶ However, the number of patients acquiring MRSA in ICUs was low at 0 to 3.3%. The report recognises that dealing with the problem of ICU-associated MRSA is multifaceted. It is difficult to control MRSA acquisition within a unit, when the patient population has a high prevalence of MRSA carriage on admission. While most patients are screened on admission, there is still a significant delay in the identification of MRSA, using culture techniques alone. The report concludes that there is a need for rapid identification of MRSA carriage, along with the provision of more isolation rooms, facilitating prompt isolation of colonised patients, to minimise ICU-acquired MRSA.

Routine weekly prevalence surveillance has limitations and long-term enhanced surveillance would give a more complete picture of the burden of MRSA in Irish ICUs.

2.3 MRSA bloodstream infection in Ireland and in other European countries

According to data from the European Antimicrobial Resistance Surveillance System (EARSS), there were 1,240 reports of *S. aureus* bloodstream infections in Ireland in 2008; of these, 33.9% were MRSA (Figure 3).⁷ The provisional data for the first three quarters of 2009 shows a decline to 28% in the percentage attributed to MRSA.⁸ This is the lowest percentage attributed to MRSA since surveillance began in 1999. This decline is welcome however it should be noted that the incidence in this country is still significantly higher than that seen in many other EU countries (Figure 4) and it is appropriate to be cautious pending confirmation of the trend over a longer surveillance period.

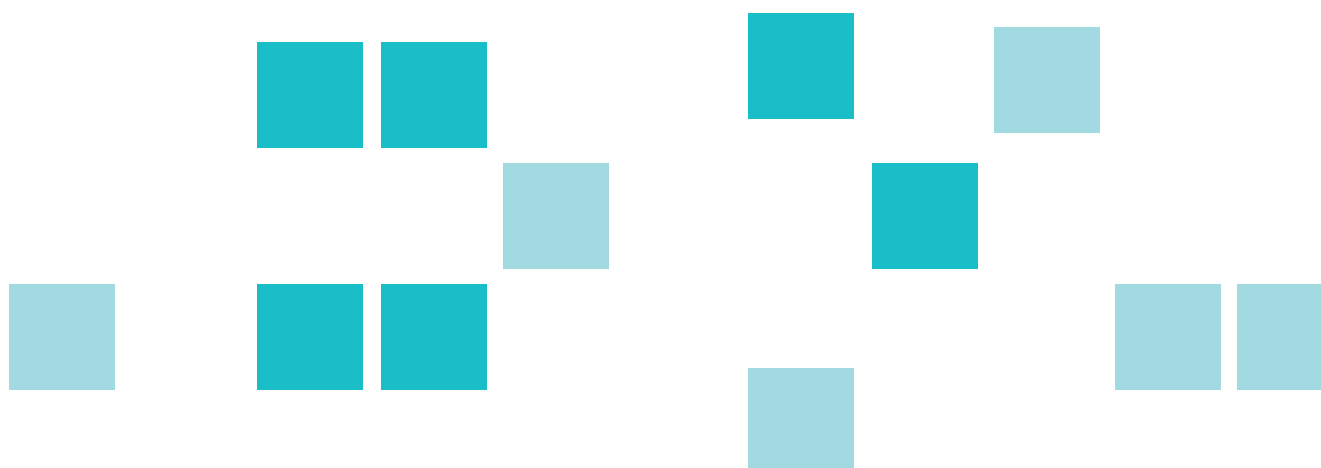
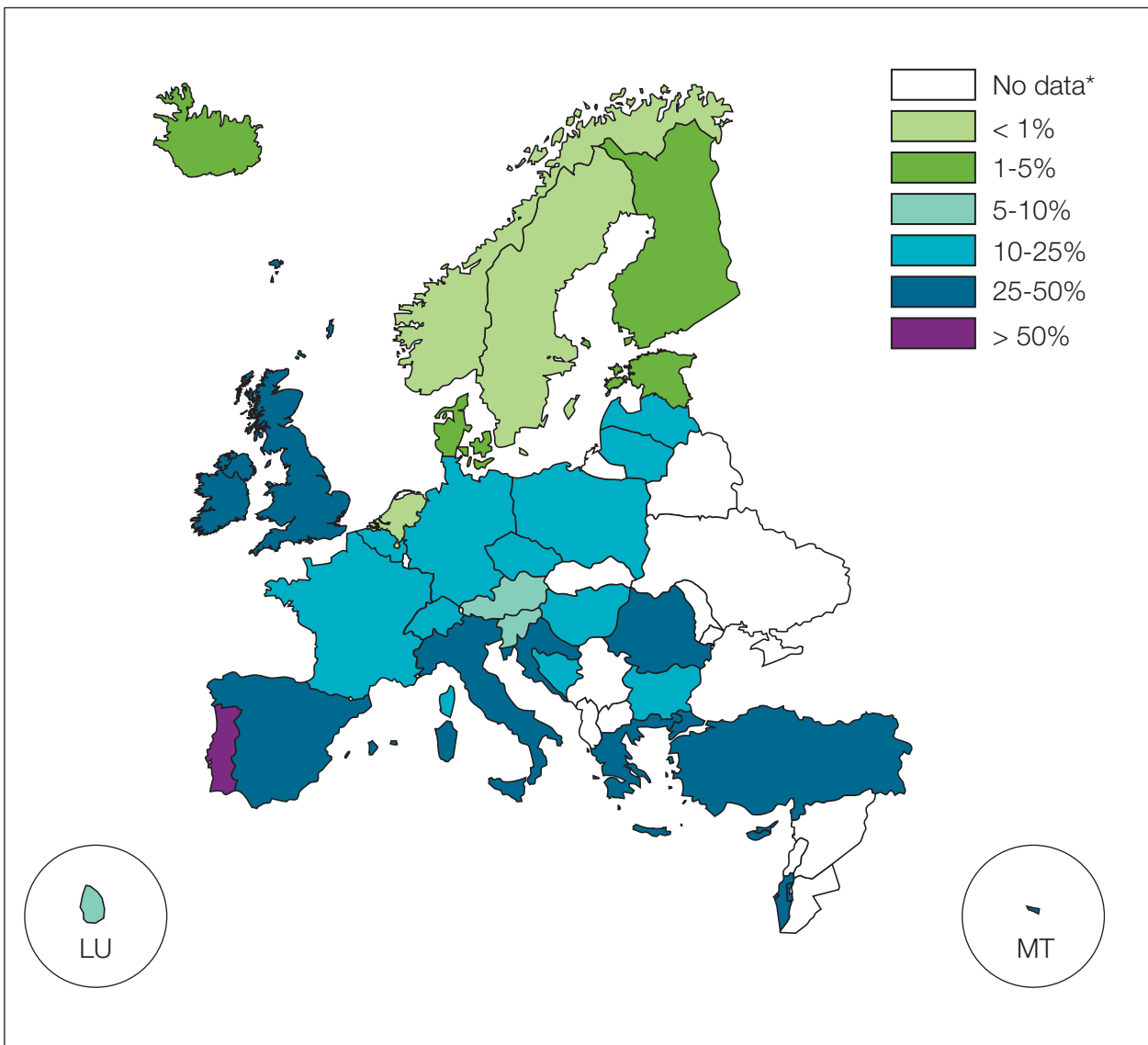


Figure 3: European Antimicrobial Resistance Surveillance System (EARSS)
Annual Report 2008, p. 57⁷



S. aureus: proportion of invasive isolates resistant to methicillin (MRSA) in 2008

*These countries did not report any data or reported less than 10 isolates

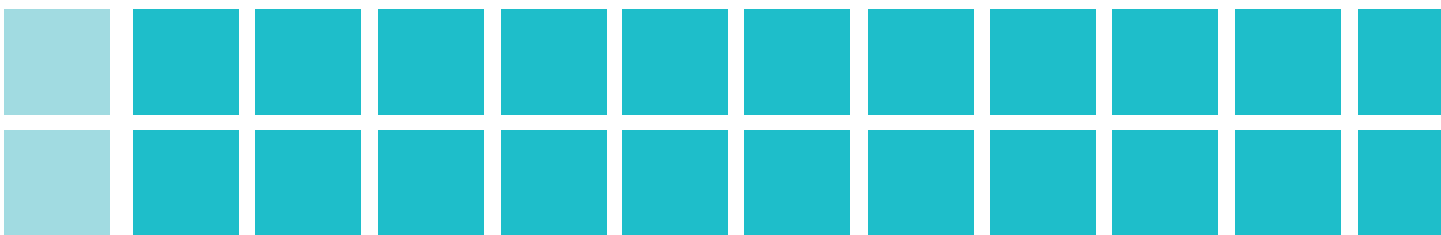
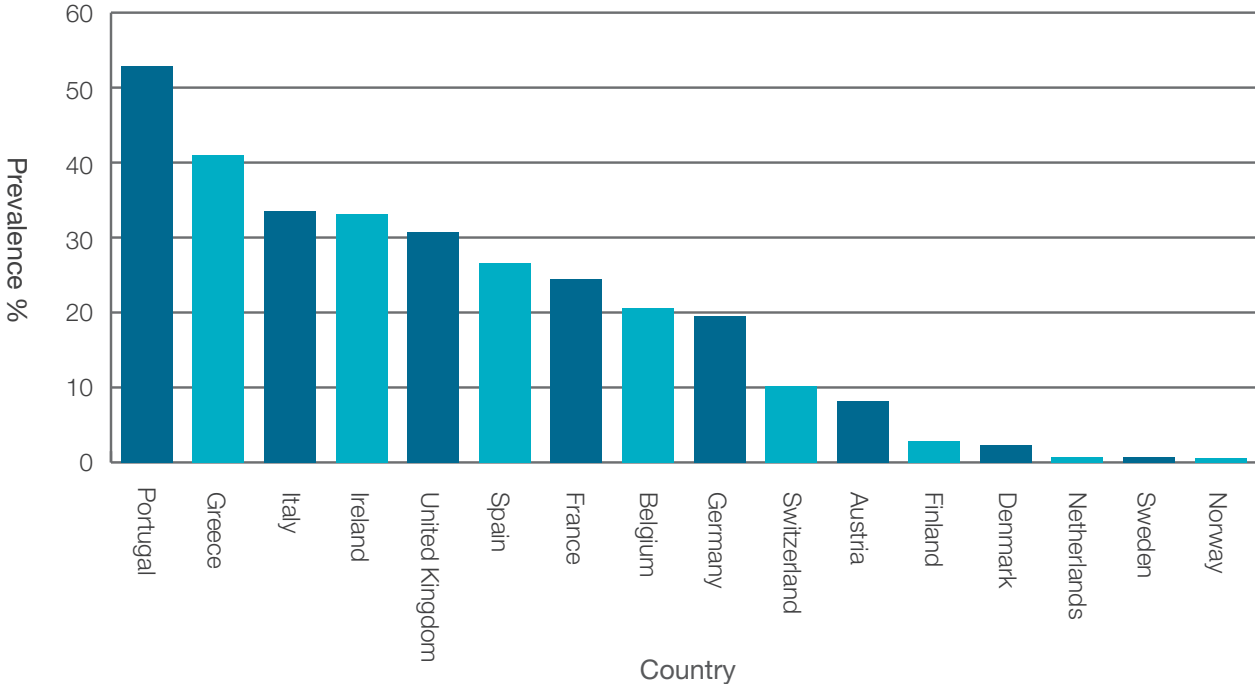


Figure 4: Susceptibility results for *S. aureus* isolates in different EU countries in 2008^{7,8}



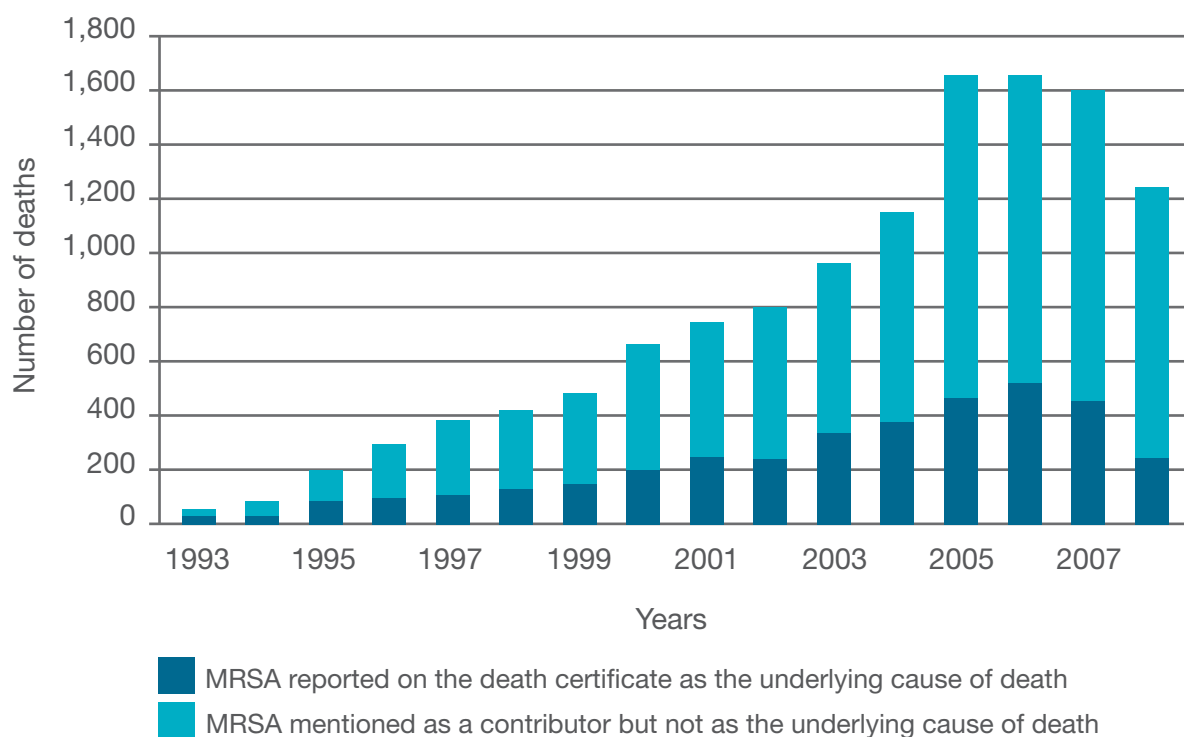
2.4 Reporting of death associated with MRSA

In Ireland, *S. aureus* BSI (both meticillin sensitive and meticillin resistant) is notifiable under the Infectious Diseases Legislation. This means that a medical practitioner is obliged to inform the Medical Officer of Health (MOH) of all cases of BSI. However, there is no legal obligation to notify the MOH of the outcome (recovery or death) of *S. aureus* infection. Therefore information on the number of deaths related to *S. aureus* BSI is not collected in a systematic way and there is no reliable published data on death due to MSSA or MRSA BSI.

In response to increased public concern about MRSA, the Minister for Health and Children wrote to the HSE in December 2005 recommending that 'MRSA should be recorded on death certificates, when it is a primary or contributory cause of death'. Since 2006, coroners in Ireland have recommended that all deaths from MRSA should be reported prior to the signing of the death certificate. The Coroner Service clearly states that the coroner should be informed of any death associated with HCAI.

In England and Wales, it has been shown that the number of death certificates indicating MRSA as a cause or contributory factor to death saw a sustained increase from 51 in 1993 to 1,652 in 2006, with a slight decrease to 1,593 in 2007 and a further reduction in 2008 (Figure 5).^{9,10} Some of this rise in MRSA reporting is likely due to increased awareness and reporting by certifying doctors and coroners.¹¹

Figure 5: Number of deaths certificates mentioning *S. aureus* by meticillin resistance and meticillin susceptibility in England and Wales 1993-2008.⁹



In 2007, a confidential study of deaths between 2005 and 2007 in patients with MRSA was undertaken in the UK by the Health Protection Agency (HPA), in collaboration with the Office for National Statistics (ONS).¹² This was a qualitative research study providing an in-depth description and evaluation of patient and institutional factors leading to the deaths of a small randomly selected sample of patients following MRSA infection, which occurred in National Health Service (NHS) hospitals in the UK. The key findings were that the majority of patients who died following MRSA infection were older: 80% were over 70 years, with only one case under 50. The patients had other significant health issues: three quarters having at least two co-morbidities and they were seriously ill, irrespective of their infection, with assessed predicted life expectancies tending to be short.

The UK Office for National Statistics Death Certificate Advisory Group produced specific guidance related to deaths involving infection and communicable diseases, with a specific sub-section on HCAI.¹³ They advise that where death is due to an infectious aetiology, the manifestation or body site (e.g. pneumonia), the infecting organism, antibiotic resistance (if relevant) and the source or route of infection should be stated, if known.

A recent two year multi-institutional study in Ireland, presented at the November 2008 Irish Society of Clinical Microbiologists (ISCM) Autumn Scientific Meeting, shows similar reporting shortcomings in death certification. This suggests that like England and Wales, death certification data is unlikely to be a reliable tool for surveillance of MRSA related mortality in this country.



3 The economic impact of MRSA related infection and colonisation

3.1 Costs to the health system

A full analysis of the cost of MRSA to the Irish healthcare system has not been carried out, but the factors contributing to direct hospital costs of HCAI are well known. The main factor contributing to increased costs is length of stay, accounting for an average of 11 extra days in hospital. A UK study conducted in one district general hospital in 2000 reported:¹⁵

- * the cost of treating patients with one or more HCAI was 2.8 times greater than for non-infected patients, with an average additional cost of £2,917 (€3,221) per case.
- * patients who acquired an infection stayed in hospital 2.5 times longer than other patients, averaging 11 additional days in hospital.
- * patients who acquired an infection in hospital were 7.1 times more likely than uninfected patients to die in hospital.


The HSE calculated that of the order of 25,000 patients may acquire HCAI annually based on the HIS point prevalence study.⁵ This number of HCAI could account for approximately 275,000 additional bed days (assuming 11 additional days in hospital per patient).

Taking an average of €850 per day,¹⁶ the additional hospital expenditure due to HCAI is approximately €233.75 million. If 10% of HCAI is due to MRSA, it follows that MRSA infection in the hospital setting alone costs €23 million annually. The actual figure may be higher than this, given that MRSA is 1.2 to 2 times more expensive to manage than MSSA.¹⁷

It has been estimated that approximately one third of HCAI is preventable¹⁸ therefore the potential saving from preventable MRSA infection in Ireland is approximately €7.6 million.

There is a further healthcare cost related to HCAI following discharge from hospital. These patients have greater contact with their general practitioner, more frequent hospital outpatient visits and more frequent visits from the public health nurse, adding to the cost to the healthcare system.¹⁵





MRSA infection in the hospital setting costs €23 million annually.

3.2 Costs to patients, carers and the economy

This UK study demonstrated a significant impact of HCAI on costs generally:¹⁵

- * Patients with HCAI took up to 17 additional days to return to their normal daily activities, compared to those without HCAI.
- * Those in paid employment took an average of six extra days to return to work if they acquired HCAI, with an estimated cost of up to £800 (€883) per patient.
- * Patients with HCAI, particularly those with infections identified post-discharge, received more care from informal carers (i.e. family members or friends) than did those without HCAI. The average additional need for such care for those with both pre- and post-discharge infections was six days, costing £454 (€501) per patient.

Despite the global impact of HCAI, most economic analyses evaluate the direct costs of HCAI primarily from a hospital perspective. Few consider the indirect costs of healthcare-associated infections on the patient community and broader society and indeed the intangible costs of the impact on patient quality of life.

At a national level, the lost output resulting from HCAI has an impact on gross domestic product. There are no figures in Ireland to reflect that impact but in the UK the global cost has been estimated at between £3 billion and £11 billion annually.¹⁹ A *pro-rata* figure would apply to Ireland.

4 The prevention and control of MRSA colonisation and infection

The Report of the Consensus Conference on Antibiotic Resistance; Prevention and Control (ARPAC) highlighted the importance of infection prevention and control and prudent antimicrobial use in preventing and controlling MRSA.²⁰

4.1 Infection prevention and control

A general principle of individual and corporate responsibility for infection prevention and control (IPC) applies. IPC is the responsibility of every healthcare worker, but it must also be placed at the top of the corporate agenda. It should be regarded as a key quality indicator and should be adequately resourced. Patients can play an important role. They should expect those who care for them to be fully compliant with infection control procedures at all times. Healthcare systems should seek to empower patients and staff to speak out, if the need arises.

In 2000, the Department of Health and Children recognised the need to focus on the prevention of HCAI in general and on MRSA in particular. The Strategy for the Control of Antimicrobial Resistance (SARI) was published in 2001 and since then a series of recommendations relating to the prevention of HCAI have been produced by the Health Protection Surveillance Centre (HPSC).

The following are some of the published guidelines in Ireland for prevention and/or control of MRSA:

- *Control and Prevention of MRSA in Hospitals and in the Community 2005.*²¹
- *Guidelines for Hand Hygiene in Irish Health Care Settings 2005.*²²
- *Infection Prevention and Control Building Guidelines for Acute Hospitals in Ireland 2009.*²³
- *Prevention of Intravascular Catheter-Related Infection in Ireland 2009.*²⁴

The following are in development:

- * Guidelines for the Prevention of Ventilator-Associated Pneumonia
- * Guidelines for the Prevention of Urinary Catheter Infections
- *Health Information and Quality Authority (HIQA): National Standards for the Prevention and Control of Healthcare-Associated Infections* was published in 2009.²⁵ There are twelve standards encompassing HCAI governance including the following:
 - » physical environment of the healthcare facility
 - » staff resource requirement
 - » hand hygiene
 - » management of outbreaks
 - » HCAI surveillance
 - » microbiology services
 - » antimicrobial stewardship

4.2 Antimicrobial consumption

Antimicrobial consumption in Ireland is relatively high in comparison to other EU countries.²⁶ Consumption of antimicrobials in public acute hospitals in Ireland 2008 was calculated at an average use of 76.4 defined daily doses (DDD) per 1000 occupied in-patient bed days.²⁷ This was a 5% decrease from 2007, which may reflect the deployment of additional resources in hospitals to implement antimicrobial stewardship initiatives.

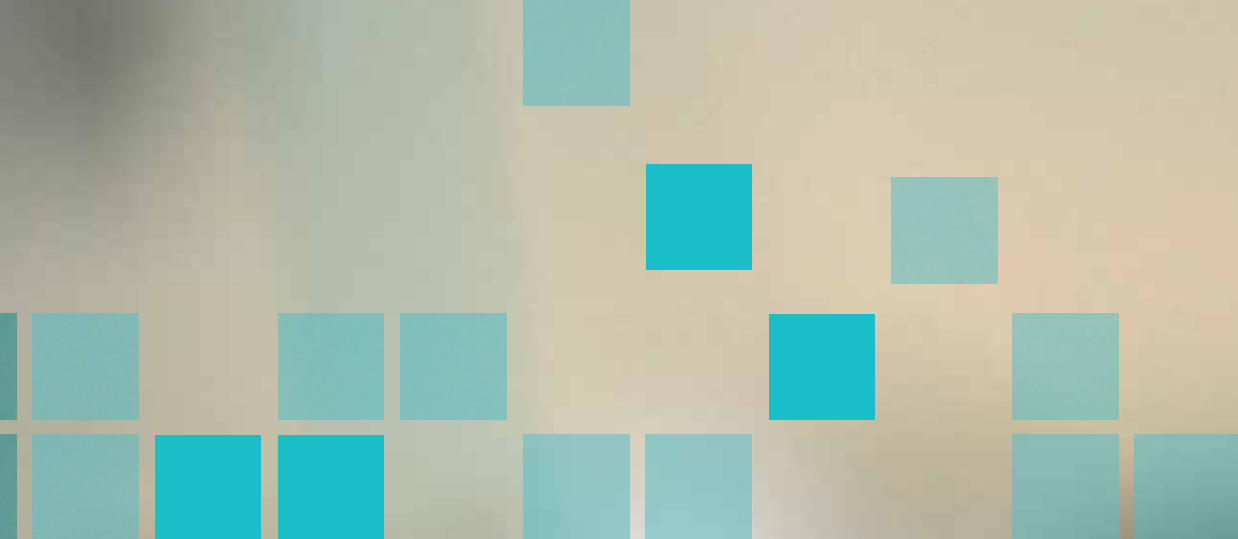
The DDD per bed days or per head of population is an internationally recognised unit of antibiotic consumption, while accounting for activity (bed days) or population size. It can be used to compare usage between hospitals, regions or countries. Interpreting this rate must be done with caution, as it does not take account of the case-mix within the hospital or the nature of the population in the hospitals' catchment area (i.e. a young or an aged population). A hospital with a very high rate of antimicrobial consumption may have a large intensive care unit, a haematology unit or a transplant unit requiring high-level use of antibiotics. A hospital with a very low rate may have such a rate because it does not have any of these high-use specialties and not because it has more prudent prescribing of antibiotics. Nevertheless the DDD per bed days is an extremely useful rate to allow a basic comparison of consumption; however it is most useful when comparing trends over time within an individual hospital or ward.

The overall outpatient antibiotic consumption for Ireland in 2008 was 21.5 defined daily doses per 1000 inhabitants (DID), a fall from the previous years rate of 22.4 DID, the first decrease since 2000.²⁷ This rate is mid-to-high in European terms.²⁶ Preliminary estimates of overall outpatient antibiotic consumption for the first half of 2009 was 20.3 DID.²⁸



4.3 Improving the prescribing of antimicrobials

The 2001 *Strategy for the Control of Antimicrobial Resistance in Ireland* (SARI) placed a particular emphasis on appropriate prescribing of antimicrobials. The importance of antimicrobial stewardship in limiting the emergence of MRSA and other resistant pathogens in both the hospital and the community setting is well documented internationally and is highlighted by both the Royal College of Physicians of Ireland (RCPI) and by HIQA. This document makes recommendations on the structure and organisation of antimicrobial stewardship in hospitals, the key antimicrobial stewardship interventions and examples of other interventions that can be carried out to reduce unnecessary antibiotic use. The *Guidelines for Antimicrobial Stewardship in Hospitals in Ireland* were updated in 2009.²⁹



Once medically fit, patients with MRSA infection can be discharged.

5 The management of MRSA infection and colonisation

5.1 Communication with patients about their MRSA status

Patients must be advised of their MRSA status by their medical team and are entitled to expect complete confidentiality. With the patients' consent, their MRSA status may be discussed with nominated relatives or friends to ensure that they have appropriate information. In some circumstances, where the patient is unable to consent to release of information, consideration should be given to how essential information can be provided to carers, with due regard to the patients' right to privacy.

Informing patients should be done as sensitively as possible and a patient information leaflet should be provided. Adequate documentation should be maintained. There should be an opportunity for questions and patients should be advised that any further issues which arise can be addressed in the future. In respect of signs used in health care facilities to alert health care workers to the need for extra infection control precautions when entering specific rooms or areas, patient confidentiality should be respected to the greatest extent possible.



5.2 Treatment of *S. aureus* infection

A number of different antibiotics are used to treat MRSA infection, including those with specific licenses for MRSA and other older drugs, which may not have a specific license but which are widely regarded as effective.

Table 1: Selected commonly used antibiotics to treat MRSA infection

Formulation of Antibiotic			
Oral Only	Oral and Intravenous	Intravenous Only	Topical Agents
Nitrofurantoin (UTI only)	Clindamycin	Daptomycin	Chloramphenicol
Tetracycline	Co-trimoxazole	Gentamicin	Fusidic acid
Trimethoprim	Erythromycin	Quinupristin/ dalfopristin	Mupirocin
	Fusidic acid	Teicoplanin	Neomycin
	Linezolid	Tigecycline	
	Rifampicin	Vancomycin	

As with any medicine, antibiotics may cause adverse events. It may be appropriate to initiate treatment with a broad-spectrum agent and streamline to a more specific antibiotic when susceptibility profile results are available and the overall clinical picture is clearer.

5.3 Eradication of MRSA carriage

Patients colonised with MRSA who are due to undergo an elective surgical procedure, have a prosthesis in situ or are in a clinical area where there is a high risk of colonisation leading to invasive infection, e.g. the ICU, should be evaluated for decolonisation.²¹ A risk assessment of other patients such as long-stay patients or patients with chronic nasal colonisation should be carried out to determine if nasal decolonisation should be attempted. However, excessive use of nasal decolonisation agents should be avoided, as this can lead to the emergence of resistance.

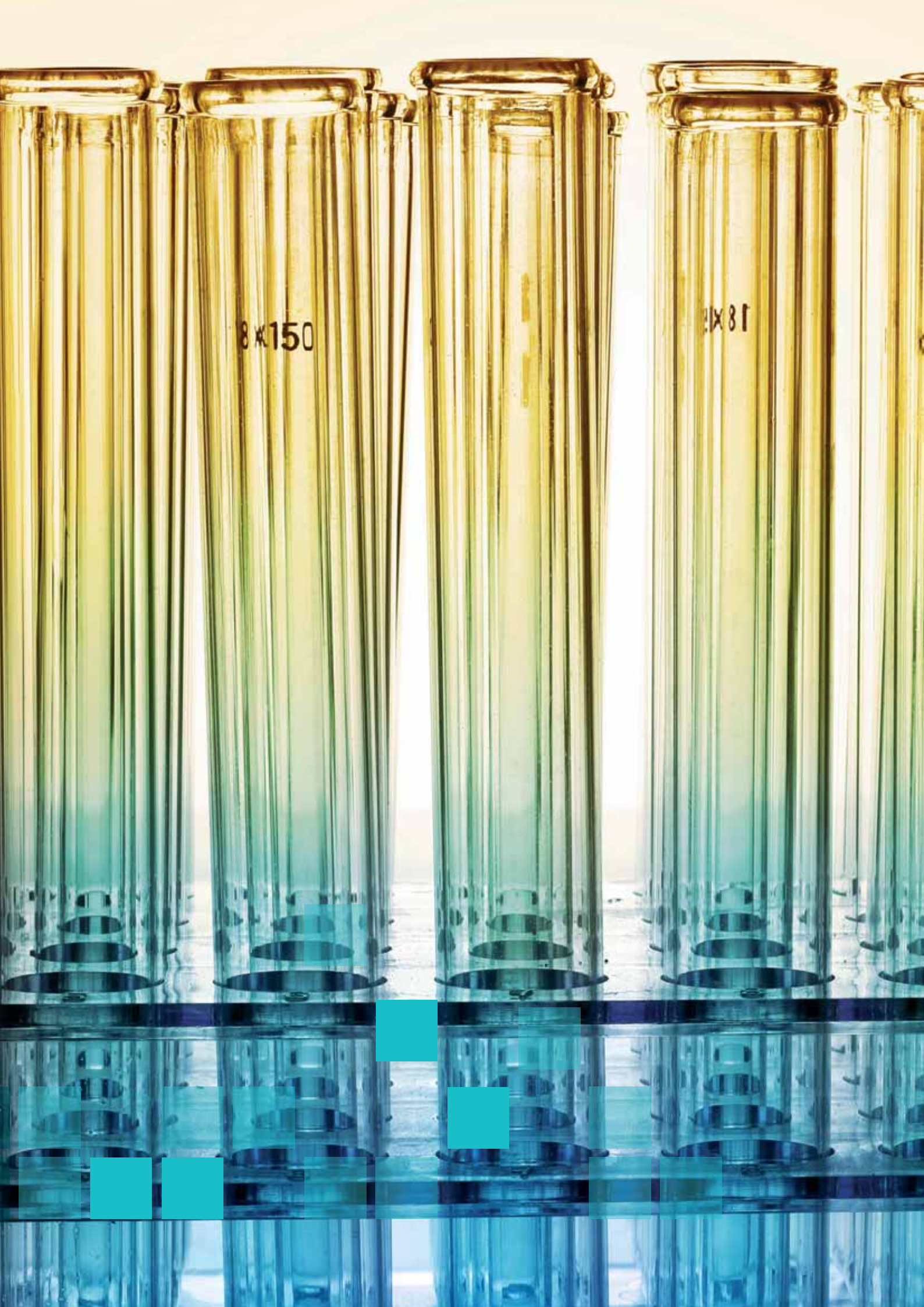
Decolonisation often involves the application of 2% mupirocin in paraffin base to the inner surface of each nostril three times daily for five days. The patient should be rescreened for MRSA 48 hours after completing a course of treatment. If the swab remains positive for MRSA, retreatment with mupirocin may be repeated once only. In general and if the patients' skin condition allows, patients are also required to bathe daily for five days and shampoo twice weekly with an antiseptic detergent, such as 4% chlorhexidine, or 7.5% povidone-iodine.

In some circumstances, as in the case of infants or patients with throat carriage, attempts at decolonisation may require additional or alternative measures.

5.4 Hospital discharge of patients with MRSA

Patients colonised or infected with MRSA should be discharged from hospital when their clinical care no longer requires hospitalisation. In most cases, MRSA colonisation clears over time once antibiotics have been discontinued,² particularly in patients with intact skin. Hand hygiene and normal hygiene standards in the home will help prevent transmission. MRSA does not usually constitute a significant risk to healthy older people, pregnant women and the very young.³⁰

There is no contraindication to patients colonised with MRSA being transferred to a residential or nursing home, once standard precautions are followed. In general, residents with MRSA are not a significant risk to other residents, staff, visitors or family. It is appropriate to share a room, once neither occupant has a skin lesion, an indwelling urinary catheter or similar risk factor and such residents can join others in communal areas once skin lesions are dressed.³¹



8x150

2x81

5.4.1 Home antibiotic treatment

Traditionally, patients with MRSA infection have been treated in hospital, usually with intravenous antibiotics, which in some cases may be the only indication for continued hospitalisation. Switching to an oral antibiotic when appropriate has many advantages, even for hospitalised patients, and may facilitate earlier discharge.

Studies regarding the impact of oral antibiotic treatment for MRSA infection, compared with the continuation of intravenous antibiotics have consistently shown reductions in length of stay for patients receiving oral treatment.³²⁻³⁶ The 'Going Home' study demonstrated a reduction of 1,215 bed days among 64 patients representing a median reduction of 14 days per person (range 1–84). An additional 511 days of in-patient intravenous therapy were prevented by switching to oral therapy in patients who could not be discharged home.³⁷

While a number of antibiotic agents are commonly used to treat serious MRSA infection, many are only available for intravenous use (see table 1). It may be that where a switch to an oral antibiotic is still not possible, MRSA infection can be treated in the community, using outpatient parenteral antimicrobial therapy (OPAT) services, where intravenous antibiotics are administered in the home by community nurses, patients, carers or outpatient clinic staff. Microbiology or infectious diseases advice should be sought before starting intravenous therapy at home. For many years, OPAT has been shown to be a safe, efficacious and cost effective way of treating patients with serious bacterial infections in the US.³⁸ Recently, it has been widely used internationally³⁹ and is associated with favourable clinical, economic, safety and patient satisfaction outcomes.⁴⁰

OPAT is less well established in Ireland. A growing number of centres now offer OPAT services in a variety of forms and for different infections. OPAT use is encouraged, if applicable, in the current national guidelines for antimicrobial stewardship in hospitals. Community intervention teams are currently in place in some areas and will administer intravenous antibiotics to patients in the community, encouraging early discharge.

Patients managed by an infectious diseases physician were discharged earlier than those cared for by other physicians, as the patient was more likely to receive OPAT or to be switched to oral antibiotics. The earlier discharge had no effect on patient outcome.⁴¹

There is very little health economic analysis of the impact of home treatment of MRSA infection in Ireland. Most of the studies are from the UK, North America or Australia, but their findings are consistent in revealing reduced overall costs, compared with in-patient treatment and are worthy of consideration, as they provide some insight into the potential impact on resource allocation in Ireland.

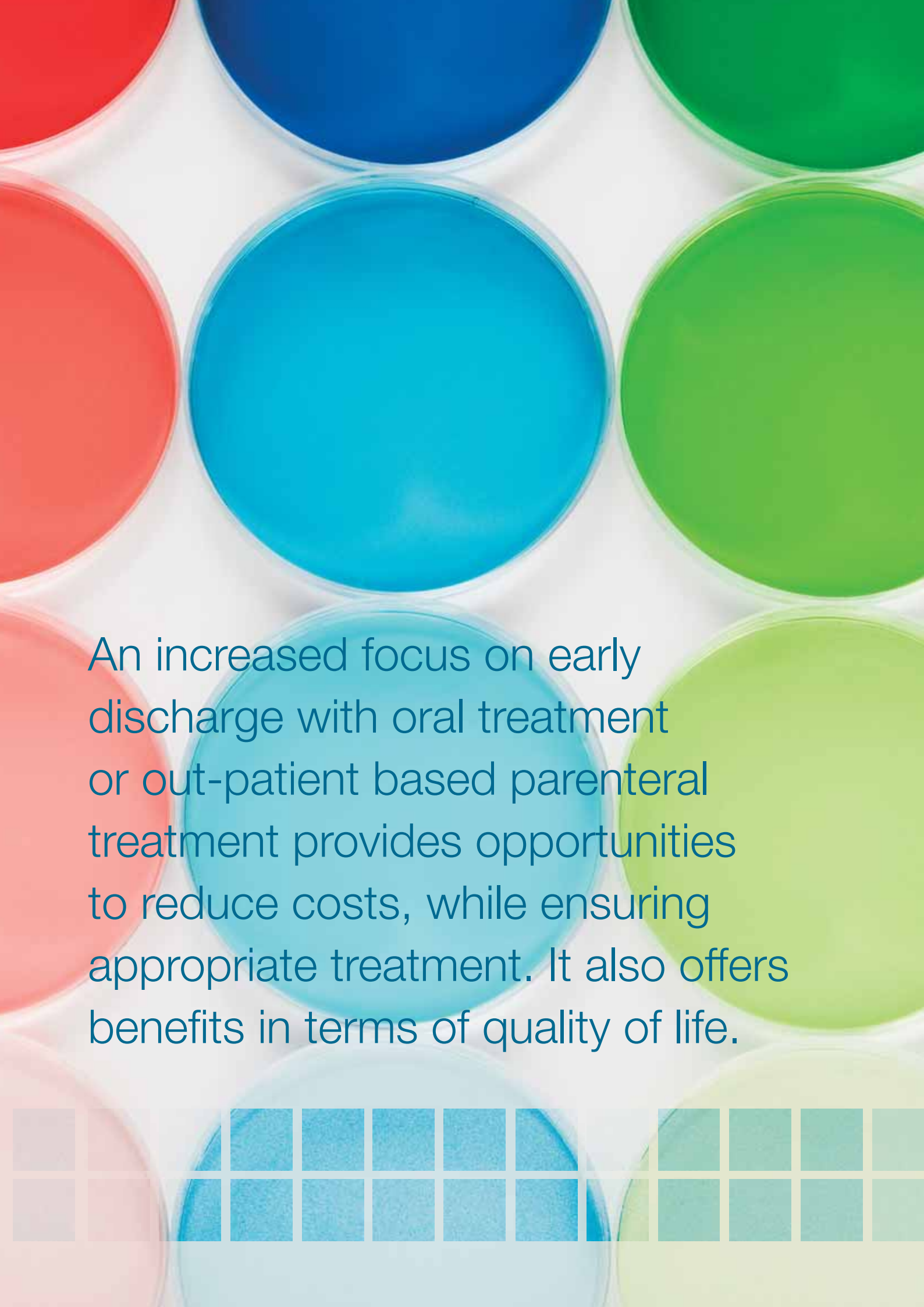
5.4.2 Discharge planning and HCAI

Despite the fact that many patients with HCAI can be discharged and despite recommendations and reports to help improve discharge policies, process and procedures, the reality is that many patients cannot be discharged from acute hospitals due to the lack of long-term residential care and they remain in the acute setting for longer than required.

An additional problem is the increased risk to those patients of acquiring a HCAI. A small study at an Irish university hospital showed that the rate of HCAI among delayed discharge patients was 15%, three times the national average.⁴² Of the patients with HCAI, two thirds had been declared medically fit for discharge but were awaiting long-term care. Figures from the Economic and Social Research Institute (ESRI) reveal a 58% increase in delayed discharge patients during the last two years with 900 people now in hospital who are medically fit for discharge.⁴³

Advantages of appropriate discharge with home antibiotic treatment	
Patient Benefits	Hospital Benefits
Convalescence in comfort of own home rather than in hospital	Potential reduction in rates of HCAI
Avoid the discomfort and risk of infection associated with an intravenous line, when switched to oral antibiotics	Improved bed management enabling more patients to be admitted and treated
Reduced risk of acquiring HCAI	Reduced duration of hospital stay, with associated cost savings





An increased focus on early discharge with oral treatment or out-patient based parenteral treatment provides opportunities to reduce costs, while ensuring appropriate treatment. It also offers benefits in terms of quality of life.



Conclusion

MRSA was first documented in 1961 and has been a challenge to the Irish health care system for nearly three decades. There is good evidence that MRSA is a significant problem in Ireland and the burden of infection is greater here than in many European countries. Increased focus on the problem in the last number of years has been associated with a welcome decline in the number of MRSA BSI. This is a positive development but it is not easy to confirm a clear cause and effect relationship. There are still significant numbers of patients becoming colonised with MRSA and in some patients, infection supervenes with significant morbidity and indeed mortality.

There is also an attendant cost to the healthcare system and therefore prevention of infection represents a significant potential saving. There have also been advances in diagnosis and indeed treatment, but these developments are not without additional cost, which in some cases can be substantial. An increased focus on early discharge with oral treatment or out-patient based parenteral treatment provides opportunities to reduce costs, while ensuring appropriate treatment. It also offers benefits in terms of quality of life.

While much has been done, there is still much to do and in times of limited resources, it is crucial that MRSA and other HCAI, continue to feature prominently on the quality agenda.



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